THE PLAINS ANTHROPOLOGIST

FRANKLIN FENENGA, EDITOR NUMBER 8, MAY, 1957

CONTENTS

Editor's Notes. 2

Some Highway Culture Patterns 3
John M. Roberts, Robert M. Kozelka, and Malcolm J. Arth

The Archeology of the Agate Bluff Area, Colorado. 15
Cynthia Irwin and Henry Irwin

Ethnohistory and the Plains Conference. 39
David A. Baerreis

Notes on a Burned Earth Lodge at the Ward Site, North Dakota 41
W. Raymond Wood

The Fourteenth Plains Conference - 1956 43
Richard P. Wheeler

A MEDIUM FOR THE PUBLICATION OF THE RESULTS OF ANTHROPOLOGICAL AND RELATED RESEARCHES IN THE PLAINS

THE PLAINS ANTHROPOLOGIST

Number 8 - May, 1957

A Medium for the Publication of the Results of Anthropological and Related Research in the Plains*

Franklin Fenenga, Editor

CONTENTS

Editor's Notes. 2

Some Highway Culture Patterns 3
John M. Roberts, Robert M. Kozelka, and Malcolm J. Arth

The Archeology of the Agate Bluff Area, Colorado. 15
Cynthia Irwin and Henry Irwin

Ethnohistory and the Plains Conference. 39
David A. Baerreis

Notes on a Burned Earth Lodge at the Ward Site, North Dakota 41
W. Raymond Wood

The Fourteenth Plains Conference - 1956. 43
Richard P. Wheeler

*Material for publication, books for review, questions and subscriptions ($2.00 per year) should be addressed to the Editor, c/o Laboratory of Anthropology, University of Nebraska, Lincoln, Nebraska.

EDITOR'S NOTES

The 15th Conference for Plains Archeology will be held at the Laboratory of Anthropology, University of Nebraska, Lincoln, November 28 to 30. Chairman of the 15th Conference is Wesley R. Hurt, Jr. of the W. H. Over Museum, University of South Dakota, Vermillion. This year the Conference will meet jointly with the American Indian Ethnohistoric Conference. D. A. Baerreis, President, discusses the background and aims of the group on pages 39 and 40 of this issue. Joint sessions of the two Conferences will deal primarily with problems concerning the Arikara.

There have been a number of personnel changes in our area during the Spring and Summer of 1957: James Howard has joined the staff of the Department of Sociology and Anthropology, University of North Dakota; Roscoe Wilmuth is Assistant Museum Director for the Kansas State Historical Society; W. Raymond Wood is with the Department of Anthropology, University of Missouri; Alan Woolworth has joined the staff of the Fort Dearborn Museum, Michigan; William Biddle is now teaching in the Department of Anthropology, University of Oklahoma; Daniel J. Scheans is Assistant Curator for the North Dakota Historical Society; Robert Bray is now at the Effigy Mounds, MacGregor, Iowa. He is replacing Wilfred Logan who has gone to Ocmulgee National Monument, Macon, Georgia.

Among new publications of interest are: George Catlin, Painter of Indians and the West by John C. Ewers, Smithsonian Report for 1955; A Sioux Chronicle by George Hyde; the University of Oklahoma Press; Personality in a Communal Society by Bert Kaplan and Thomas F. A. Plaut, University of Kansas Publications, Social Science Studies; and Zuni Kin Terms by David M. Schneider and John M. Roberts and Zuni Daily Life by John M. Roberts, Notebook No. 3, Laboratory of Anthropology, University of Nebraska.

Harold Janzen, who described the process of acrylic casting in Number 7 of the PLAINS ANTHROPOLOGIST, is now prepared to make casts of museum specimens on a commercial basis. He may be contacted at Apartment 206C, Huskerville, Lincoln 8, Nebraska.

SOME HIGHWAY CULTURE PATTERNS

John M. Roberts, Robert M. Kozelka, and Malcolm J. Arth

A concern with highway cultures is recent in anthropology. Although anthropologists have dealt with cultures of groups which were widely variant in many respects (bands, tribes, communities, households, etc.) they have still restricted their interest, in the main, to groups which, from the viewpoint of a short term field study, appeared to possess relatively stable memberships. Even these groups, of course, are constantly subject to change through death, birth, recruitment, withdrawal, or other factors, but their memberships change less rapidly than those of such other well-defined groups as those found at fairs, fiestas, markets, railroad stations, football games, or theaters. Cultures defined by groups in the latter category may be termed "concourse" cultures and they are distinguished by definite environmental settings, rapidly changing group memberships, and distinctive patterned behaviors. One of the most interesting concourse cultures to be found in contemporary America is that defined by the complex group composed of travelers on a modern transcontinental highway together with groups specifically organized to serve the needs of these travelers. This paper will deal with some of the patterns found in a specific concourse culture of this type, the culture associated with Highway 30 in Nebraska.

Although the investigation of a highway culture unquestionably presents problems which are unfamiliar in general ethnography, a highway culture possesses features which favor pattern analysis and functional studies. It is true that the membership of the large, interacting group is constantly changing, but the group itself is always present (in contrast, a fiesta is held only once a year). Again, the culture is peculiarly public and open to examination. Moreover, within the defining social system, interaction is limited and the associated culture is also reduced in content with the result that some variables can either be eliminated or held constant. It is of some consequence, too, that highways are visibly important in American life. Ultimately the scientific study of highway and other concourse cultures should contribute to anthropological theory and method, aid in the description of complex societies and cultures, and further the solution of a variety of applied aims.

Despite regional differences in landscapes and communities, American highway culture is both strikingly uniform and restricted in inventory. The traveler on a transcontinental highway always finds himself in a limited environment. At night, the driver can see little to the right or left beyond the range of the headlights of his car. The cues within this perceptual field are almost exclusively artifacts produced by his own national culture. He is traveling in a man-made "tube" almost to the same degree as a passenger on a subway train. By day, the situation is little changed. True, he can now view the landscape, but on manly highways thousands

of man-made cues (signs, buildings, traffic, etc.,) compete for his attention. From state to state or from region to region, there is great similarity in the characteristics of the highway complex.

Within the "tube" the traveler's relationships with his fellow men are also limited. For long periods of time, he either drives alone or travels as a member of a small group of persons in a vehicle. When he stops, his interaction with other travelers or with local people is likely to be restricted, neutral, or "urban" in character. Yet stop and interact he must. This interactive system is, in fact, central in the highway complex and some of the patterns related to the system and displayed by non-commercial through travelers constitute the focus of this paper.

The data presented in this article were obtained in one of a series of small investigations of the culture of U.S. 30 in Nebraska which were conducted during the summers of 1954, 1955, and 1956. The research was supported by a grant made to the senior author by the Research Council of the University of Nebraska.) The first published report based on this research dealt with the small business establishments (motels, filling stations, cafes, etc.) which fronted on the highway (Roberts, John M.,Kozelka, Robert M., Kiehl, Mary L., and Newman, Thomas M., "The Small Highway Business on U.S. 30 in Nebraska," Economic Geography, Vol. 32, pp. 139-152; 1956). Forthcoming reports will discuss other features of the highway culture and social system. To the best of the authors' knowledge, the total inquiry in highway culture has no precedent in anthropological research.

The techniques used in making the field investigation on which this report is based were simple and geared to a low budget. Direct observation and interviewing were employed to some extent, but most of the data reported here were derived from responses to five brief questionnaires which were first pretested on Highway U.S. 6 in Nebraska and then used along U.S. 30 late in August and early in September 1955. Answers were obtained from 52 persons in wayside parks and from 496 motel patrons. In the latter instance, the blank questionnaires were given to travelers by the registration clerk, and then the completed forms were left with the motel key the next morning. Each of the five questionnaires was left at a number of motels selected as being representative and distributed along the entire length of the highway.

No one refused to answer the questions when approached directly in a park, but in the motels the percentage of response varied from 36% to 74%. The percentage of motel response, however, may have been slightly higher than the figures indicate since a few motels did not fill to capacity on the days when the questionnaires were completed. In all, 52 motels were used.

The Setting: Highway U.S. 30 crosses the continent between Atlantic City, New Jersey and Astoria, Oregon. Within Nebraska the 449.4

mile length of this two-lane hard surfaced highway is both the principal east-west route and the highway with the largest traffic flow. Much of the highway lies in the valley of the Platte River, the route of the historic Lincoln Highway and the still older Mormon and Oregon trails. To the tourist, the "tube" metaphor may be particularly appropriate since in Nebraska the highway lacks major tourist attractions and most cross-country travelers drive through the state with as few halts as possible.

The Group: The habit relationships ordered by any group whatsoever may be described as a culture. (This view has been discussed in Roberts, John M., Three Navaho Households: A Comparative Study in Small Group Culture, Peabody Museum of Harvard University, Papers, Vol. 40, no. 3, 1951). In the complex interactive system associated with U.S. 30 in Nebraska the persons in the ever-changing, but ever-present, traffic flow constitute the core of the ordering group. Two broad characteristics of the traffic flow are important: it is both large and seasonally variable.

In 1955, an automatic traffic counter on the open highway in the center of the state provided year-round data from which the following twenty-four averages for each month were obtained.

Table 1.

Traffic Flow on U.S. 30 in 1955*

January	2350*	May	3680	September	4191
February	2179	June	4536	October	3482
March	2628	July	4950*	November	2728
April	3074	August	5000	December	2630

*Data supplied by the Nebraska Department of Roads and Irrigation. Estimated totals are indicated by asterisk.

It is not surprising that the largest flow occurred during the summer or "tourist" months. Figures for 1953 and 1954 showed comparable increases and decreases with the season. A computation based on the 1955 averages indicates more than a million and a quarter vehicles for the year. Clearly the size and seasonal variation of the traffic flow on U.S. 30 in Nebraska are important factors in determining the magnitude of the ordering group.

Two additional general characteristics of the traffic flow are important. It is composed of diverse elements and it varies in size at different points along the highway. Data on the size and composition of the traffic flow on U.S. 30 in Nebraska are available for 1953 (a year which displayed the same general pattern as 1955 although the flow was somewhat smaller) which illustrate these points.

Table 2

Traffic Flow on U.S. 30 in Nebraska in 1953*
(Twenty-four hour Adjusted Annual Average)

Station	Out-of-State Non-Commercial	Out-of-State Commercial	Nebr. Non-Commercial	Nebr. Commercial	Total
Station 568 (between Blair and Fremont)	38%	6%	37%	19%	1632
Station 588 (Columbus)	27%	6%	48%	19%	2305
Station 587 (jct. U.S. 30A)	38%	8%	41%	13%	2032
Station 3 (Grand Island)	28%	5%	50%	17%	3821
Station 520 (near Elm Creek)	34%	8%	41%	17%	3295
Station 518 (North Platte)	36%	6%	44%	14%	3842
Station 14 (near Ogallala)	45%	7%	32%	16%	3137
Station 509 (jct. U.S. 138)	54%	12%	27%	7%	1505
Station 510 (Sidney)	37%	7%	43%	13%	2505
Station 511 (Bushnell)	51%	10%	29%	10%	1947

*Table prepared by using manual count results provided by the Nebraska Department of Roads and Irrigation. Such counts are made during different 8 hour periods on from 4 to 11 days, depending on the station. The counts are then adjusted to a 24 hour annual average basis.

Table 2 shows that the heaviest flow occurred in the central section of the highway between the junctions of highways U.S. 30A in the east and U.S. 138 in the west. A computation based on the twenty-four hour average by month in 1953 at the Elm Creek station yielded a total of 1,198,326 vehicles; 34% of this total or 407,431 was attributed to non-Nebraska non-commercial traffic.

Although the traffic flow constitutes the core of the ordering group, the group extends far beyond the traffic flow. The numerous business establishments devoted to serving travel needs and fronting on U.S. 30 have been discussed elsewhere and a consideration of the complex associated political structure will be forthcoming.

Many other groups are involved in the total system. It is not necessary to elaborate this point since every American reader can be presumed to have a participant's knowledge of highway life.

The Travelers: Since the distinctive character of the culture of U.S. 30 in Nebraska is largely due to the presence of out-of-state vehicles, the customs of such travelers must figure in any description of general highway culture. A comprehensive ethnography of these customs can not be presented here, but some travel patterns centering on the trip and on the satisfaction of needs during the trip can be considered as illustrative material. Most of the patterns discussed will be behavioral patterns, (the approach to patterns has been influenced by the paper: Kluckhohn, Clyde, "Patterning as Exemplified in Navaho Culture," in Language, Culture and Personality, Spier, L., ed., pp. 109-130, 1941) but in a few instances estimates of future and ideal performances as well as attitudes toward highway conditions will be cited.

The respondents who provided the information summarized below were through travelers who elected in late August or early September to complete questionnaire blanks within the state either after registering in a motel or while resting in a park. In the case of 534 respondents, 72% were on vacation, 15% were traveling for business reasons, 8% were moving, 2% were armed forces transfers, and the remaining 3% were traveling for miscellaneous reasons. The great majority of the travelers, then, were tourists.

The respondents traveled in small parties which varied in the age, sex, and number of members. Table 3 gives the number of responses (and percentage of total responses) to questions about party composition.

Table 3.
Composition of Traveling Parties

Number of Persons:	1	2	3	4
	61 (12%)	190 (37.4%)	93 (18.3%)	97 (19.1%)
	5	6	7-9	
	36 (7.1%)	20 (3.9%)	11 (2.2%)	

Age and Sex:	Man and Woman	M, W, 1Child	M, W, 2 Ch.	M, W, 3 Ch.
	32%	10.4%	11.3%	3.6%
	3 Adults, 1 Ch.	Man only	3 or 4 adults	Misc.
	3.6%	10.4%	12%	16.7%

Ages of Children:

No Children	1 Child Only		2 or more Children	
313 (61%)	under 3 yrs:	17	youngest under 3 yrs:	37
	3-6 yrs:	13	" 3-6 yrs:	39
	7-12 yrs:	27	" 7-12 yrs:	29
	13-17 yrs:	29	" 13-17 yrs:	6
	Total:	86 (17%)	Total:	111 (22%)

It will be noted that the majority of the parties had one to three members and that a substantial minority of the parties included children.

In general the selection of U.S. 30 as a route was the result of independent decision on the part of the travelers, but 31 (46%) had received aid from a travel or touring service. Although many were making customary vacation tours, interviews showed that the visiting of kinsmen was an important factor in the planning and conduct of vacation trips. Once planned, however, major changes in either route or time schedule did not appear to be common.

The length of the travel day in terms of hours or miles displayed some regularities. Although North Platte on U.S. 30 is on a time-zone boundary, and hence some respondents may have been confused about time, any resulting error in the averages would be negligible. Out of 188 answers, the mean starting time was 7:30 a.m. and the mean halting time was 6:03 p.m. Of motel patrons, 48 (59%) disliked driving at night, while 10 (14%) preferred night driving. 53 (68%) preferred driving only during the daytime. In an effort to assess distances, respondents were asked to estimate an average day's drive and also the "best" distance for a day's drive on a highway like U.S. 30. On the basis of 77 responses, the two averages differed by only 2 miles (458 vs. 456). 57 (74%) of these respondents gave average distances which were within 75 miles (plus or minus) of their "best" distances; of these, 55 were within 50 miles; and of these, 42 were within 25 miles. Of those 20 drivers with a discrepancy of more than 75 miles between the two statements, 9 were business men who may have faced special driving conditions.

Rates of travel were not accurately determined. The Nebraska speed limits, however, were 60 miles per hour during the day and 50 miles per hour at night.

Travelers were asked to give the location at which the day's journey originated and their expected destination at the end of the next day. The location of the point of termination of the first day's travel, of course, was known and this same point constituted the point of origin for the second day's travel. The distances were computed from this information by, in the latter case, assuming travel along the shortest main route. These two distances will be referred to as actual and proposed travel-days respectively. The data are given in Table 4.

The actual travel-day data, when fitted to a normal curve, has a mean of 434 miles and standard deviation 119 miles, with a resulting value of chi-square of 17 on 18 degrees of freedom, which corresponds to a probability of nearly 50% in random samples. The difference between actual and proposed travel-day distributions is statistically non-significant.

Table 4.
Frequencies for Actual and Proposed Travel-Days

Miles	Actual Days	Proposed Days	Miles	Actual Days	Proposed Days
0-50	0	0	500-550	19	21
50-100	1	0	550-600	12	9
100-150	1	2	600-650	5	7
150-200	5	3	650-700	2	2
200-250	0	1	700-750	0	3
250-300	11	10	750-800	1	1
300-350	9	6	800-850	0	4
350-400	21	26	850-900	0	1
400-450	22	13	900-950	0	1
450-500	22	19	950-1000	0	2
			Total	131	131

On the assumption that such travel-day distances are normally distributed, it is of interest to inquire into differences between week-day and week-end travel. The usual test for difference of means between actual travel-days yields a standard normal score of 1/2, while the variances yield approximately F= 2 on 86 and 43 degrees of freedom, which is significant at the .01 level. The data are based on 87 week-day, and 44 week-end, responses.

Every travel day was interrupted by stops. 102 parties reported a mean of between 4 and 5 stops per party. Many of these stops were multi-purpose and were thus scored in several categories in Table 5.

Table 5.
Types of Stops on U.S. 30*

Food	Gas and Oil	Lodging	Beverages	Rest-room
191 (30%)	184 (29%)	102 (16%)	37 (6%)	32 (5%)!!

Sight-seeing	Public Parks	Rest or sleep	Groceries	Misc.
12 (2%)	12 (2%)	11 (2%)	9 (1%)	43 (7%)

*All percentages are of a total of 637 purpose stops. Only 4 of the 12 sightseeing stops were made in Nebraska. The miscellaneous stops included souvenirs, visiting, shopping, checking car, photographing, telephoning or telegraphing, church, changing drivers, etc. Each was less than 1%.

Clearly, most travelers stopped to satisfy either their own biological needs or the mechanical needs of their vehicles. Few stops were made to gratify aesthetic of exploratory needs.

One indication of a type of interaction involved in travel is the daily expense of cross-country travelers. Table 6 shows such

expenses, exclusive of gas and oil, for 1, 2, 3, 4, 5, 6, and 8 adults traveling without children and for 2 adults and 0, 1, 2, 3, 4, and 5 children.

Table 6.
Average Daily Expenses, Exclusive of Gas and Oil, for Certain Traveling Groups

No. of Adults	Average Expense	No. of Cases	No. of Children and Two Adults	Average Expense	No. of Cases
1	$11.14	22	0	$15.20	45
2	$15.20	45	1	$17.64	22
3	$19.82	17	2	$21.67	27
4	$26.86	7	3	$22.14	7
5	$34.00	1	4	$20.00	2
6	$30.00	1	5	$50.00*	1
8	$35.00	1			

*Includes purchase of a new tire -- price unspecified.

It will be noticed that with adults, expenses increase nearly linearly with the number of people. The least squares line for expenses in dollars for x adults is given by the equation $y = 5.18x + 5.31$. The least square line for two adults and x children is given by the equation $y = 1.41x + 16.51$. These computations were made excluding data for which only one case was observed. The additional expenses for gas and oil would depend to some extent on distance and type of car (possibly weather), but in general could be averaged out to add a fixed amount to each observation. The linear approximation is probably more appropriate in connection with the data on adult traveling groups.

It is interesting in this connection to consider the pattern of stopping displayed by the respondents to one questionnaire. Table 7 gives mean distance between 2, 3, 4, 5, 6, and 7 stops, and the number of cases used.

Table 7.
Mean Distance Between Stops

Stops	To 1st	to 2nd	to 3rd	to 4th	to 5th	to 6th	to 7th	Cases
2	159	150						15
3	150	126	113					28
4	144	122	109	103				23
5	109	75	90	91	91			16
6	81	75	88	91	68	87		10
7	48	89	37	48	51	58	53	4

Experience suggests that the probability of stopping remains negligible

the first hour's driving time (roughly 40-50 miles). After the first hour, the probability increases in a non-linear fashion towards the limit unit; this limit is reached, due to the needs of cars and people, in about four or five hours. As the distance from the origin increases, the stops tend to get closer together except in the cases where there are five or more stops. In this latter instance the spacing between stops tends to be more uniform. A rough model for the pattern of stops might be represented graphically by a series of overlapping cumulative distribution functions which may be presumed to be of nearly normal type. This can be approximated by a single, nearly periodic curve, but this curve is not likely to be satisfactory for predictive purposes because of the extreme variation in stopping patterns.

In the main, the needs of the travelers were satisfied at highway business establishments, but the more self sustaining a traveling party was, the less often it would have been forced to stop. Table 8 presents information relevant to this point.

Table 8.

Basic Needs of Traveling Parties

Sleeping:
- Carried sleeping bags or bedding: 17 (19%)
- Slept in or beside car: 5 (5%)
- Slept during the day and drove at night: 8 (9%)
- Motel or hotel reservations in advance: 6 (7%)

Eating:
- Carried food: 25 (36%)
- Carried water: 72 (48%)
- Carried soft drinks: 10 (15%)
- Cooked on trip: 10 (15%)
- Ate a meal without stopping: 4 (6%)
- Snacked between meals: 28 (41%)
- Delayed eating a meal: 34 (49%)
- Missed at least one meal: 11 (16%)
- Stopped at roadside tables: 26 (32%)
- Stopped at city parks: 41 (51%)

In general, domestic patterns of sleeping and eating tended to prevail on the trip, but it is worthy of note that 17 of 63 respondents said that they had traveled more than 550 miles without sleep on at least one occasion that year. Of these, seven had driven more than 750 miles.

Customs related to illness were not important. Not one of 93 respondents reported an instance of car sickness on that particular trip. A small number, 13 (14%), had purchased medicines while on the trip, in five cases for children. Only 3 (3%) had consulted a doctor while on the trip, and one of these cases involved a child. A small number, 13 (16%), had consulted a doctor while on a trip at some time during the past five years. More, 47 (52%), carried a first-aid kit or its equivalent in the car. A small number, 7 (8%), had witnessed a serious highway accident while on the current trip.

Other factors also influenced the pattern of stops. The use of gasoline credit cards, 34 (42%), constituted a form of affiliation which probably affected choice. Needs for recreation were not important although a small percentage of respondents had attended a motion picture on their trip.

Some data on the attitude of travelers toward travel conditions were obtained from a questionnaire which asked if respondents were very satisfied, satisfied, neutral, unsatisfied, or very unsatisfied with conditions in ten areas. The consolidated results obtained from motel patrons and travelers in parks are reported below.

Table 9.

Satisfaction with Highway Conditions

Topic	Number of Respondents	Very Satisfied and Satisfied	Neutral	Very Unsatisfied and Unsatisfied
Local drinking water	90	88%	6%	7%
Motels or hotels	90	91%	7%	2%
Restroom facilities	90	76%	10%	14%
Restuarants	86	79%	19%	2%
Roadside tables	87	74%	16%	10%
Public Parks	83	77%	18%	5%
Road conditions	94	63%	18%	19%
Traffic conditions	95	77%	9%	14%
City routes	89	73%	24%	3%
Speed laws	92	86%	3%	11%

Discussion: Some general characteristics of the highway culture shared by the through travelers merit discussion. In part, the preceding pages provide illustrative material, but in part the reader will need to draw on his own expereinces as a traveler.

The reduced inventory of the Nebraska highway culture has been mentioned. It is evident that this culture which is primarily focused on meeting the instrumental need of bringing the tourist to his destination has a smaller inventory of artifacts, roles, and customs than any ordinary community culture and that it is geared to the satisfaction of fewer needs. It is striking, for example, that most of the stops by tourists in Nebraska were made to satisfy biological or mechanical needs.

Within the highway setting, however, there is an effort to preserve familiar cultural forms. Admittedly variation is provided by the tasks of driving the automobile, map reading, etc., but in terms of basic patterns of living one can only conclude that, at last in a restricted sense, the through traveler in Nebraska never leaves home. He drives in a familiar capsule en-

vironment -- his automobile. He eats, sleeps, and maintains his car in standarized situations. He is diverted by familiar programs on his car radio and on the TV set at his motel. He makes little or no attempt to acquire knowledge about the localities he traverses or the people living in them. Indeed, his interaction with people in the highway business complex is characteristically minimal and "urban" in character. (This statement is supported by the interviews with the employees associated with small businesses. Indeed, "from the viewpoint of the through traveler, the small highway business complex may be seen as an urban extension." Roberts, Kozelka, Kiehl, and Newman, op. cit.) Within the state, the tourist does not search for new sights, experiences, or relationships with people.

Even the highway and its culture is familiar, for the tourist driving its length for the first time is still able to "map" the highway and its culture with great exactitude. He is disturbed by any minor delay and an unexpected major detour is both astonishing and frustrating. He knows that he will be able to eat and sleep along the highway and that he will reach his destination on time. The data suggest that within the highway culture there is a closer agreement between the distribution of ideal performances than can be found in many cultural settings. This congruence between behavioral patterns, expected behavioral patterns and ideal patterns is the product of an enormous investment in material apparatus and in training of personnel which could only be made in a complex society. In a sense the agreement between the types of patterns and the cognitive command of the culture by its participants is strengthened by the reduction in cultural inventory and in the lack of cultural diversity. Indeed, pattern congruence, strong cognitive control, and reduction in inventory may be general characteristics of many concourse cultures.

In closing, the possibilities of highway cultures for functional, historical, and pattern studies can be briefly considered. A functional analysis of highway culture is plainly needed. One could assume that cross-country driving on a heavily traveled two-lane highway during warm weather would be fraught with fatigue and tension, and in fact,there is much evidence that this is the case. Still, many travelers accepted highway conditions with little complaint and others appeared to find such travel rewarding. Possibly life in a restricted situation, which none the less possesses some novelty, has its own rewards, at least temporarily. Obviously the traveler must be further studied at his home and at various destinations before the total behaviour pattern is clear, but it seems inevitable that further analysis of highway travel will lead directly into a consideration of general American values and culture.

Clearly, highways ought to be studied through time. The construction of super-highways is rapidly changing patterns of highway travel. The ethnography of present highways constitutes a base line for studies in cultural change.

Finally, the highway complex appears to warrant pattern analysis. The cultural inventory of the "tube" is less extensive than that of a community and its restricted situation is somewhat less analogous to those exploited in kinship and phonemic studies where the reduction in the number of variables facilitates an abstract or theoretical statement of relationships. Also the great magnitude of the phenomena in terms of numbers of persons, small groups, distances traveled, money expended, etc. makes possible the use of quantitative techniques. In the future it is hoped that the possibility of utilizing mathematical models and other aids in the description of patterns in such concourse cultures will open new frontiers of pattern analysis.

Laboratory of Anthropology
University of Nebraska

THE ARCHEOLOGY OF THE AGATE BLUFF AREA, COLORADO

Cynthia Irwin and Henry Irwin

The Agate Bluff Area is situated five miles south of the Colorado-Wyoming boundary. It can be reached by following U.S. Highway 85 north from Denver for two miles past the town of Rockport, then turning right on a dirt road and travelling over it for another half mile.

The sites, comprising 4 rock shelters, are found in a large bluff composed of heterogeneous conglomerate, lithified with a loose cement of limestone or by compaction. This rock is quite friable, contributing to great talus cones along the bottom of the bluff. The main characteristic of the bluff is the honeycombed appearance of its faces, due to extensive differential erosion in the region. The area forms the headwaters of a small intermittent stream, but there are no permanent streams in the region. There is a well nearby which may have been a spring at one time.

Among the many kinds of animals found are deer, coyotes, rabbits, gophers, prairie dogs, rattlesnakes, and bullsnakes. Some buffalo and antelope, which are protected, are also present. There are many species of birds: eagles, hawks, owls, meadow larks, magpies, and cliff swallows. The area is uncultivated, and there is little vegetation outside of a sparse covering of buffalo and other native grasses, interspersed with a few yucca and cacti. A growth of short bushes is to be found in some of the gullies. The Bluff, lying on the border between the Piedmont and the High Plains regions of Colorado at an altitude of 5914 feet, has a rather cold, dry climate, which is summarized as follows:

Annual precipitation: 14.0 inches
Maximum monthly precipitation: 2.41 inches, in January
Minimum monthly precipitation: 0.39 inches in April
Highest average monthly temperature: 66°, in July
Lowest average monthly temperature: 14°, in January
Annual average temperature: 44.9.
Average date of last killing frost in spring: May 18.
Average date of first killing frost in autumn: September 22.

The sites in the Agate Bluff Area were discovered by the authors during a field survey in 1950. A preliminary test trench was dug in Site I at this time, and extensive excavation commenced a year later in Sites I-III. After the excavation of Sites I, II, and III was concluded, work on Site IV was begun in July 1952. Excavation could be undertaken only during weekends, and the operation was not completed until June 1953. The artifacts will be on display in the Denver Museum of Natural History when exhibition space becomes available. In the preparation of this report, we are deeply indebted to Dr. H. M. Wormington of the Denver Museum of Natural History for her generous assistance and advice. We are

also grateful to D. S. Byers of the R. S. Peabody Foundation for Archaeology for his liberal aid in the preparation of the illustrations and other valuable contributions. We also acknowledge the kind help given us in identification of specimens by: Dr. A. G. Beidleman, Colorado A. and M.; Dr. George Kanakoff, Los Angeles County Museum; Mr. Marvin L. Kivett, Nebraska State Historical Society; Professor Paul Mangelsdorf, Harvard University; and Dr. Joe Ben Wheat, Colorado University.

A map of each shelter was prepared before excavation and a grid of yard squares was established. Excavation was by natural levels. All material was screened through 1/8 or 1/4 in. screen. Photographic and written records were kept throughout the operations.

Site I

Site I is situated between Sites II and III. It is 56 ft. long, with a maximum overhang of 18 ft. The roof is arched to a height of 30 ft. The shelter faces southeast. There were three levels in Site I. The surface level ranged from 7 to 9 in. in thickness, and was composed of sterile sand and gravel. The second level was from 2 to 22 in. in thickness, composed of medium coarse dry sand and dust mixed with gravel and was stained light gray by bits of charcoal and ash. The third level, from 3 to 32 in. in thickness, was composed of moist, fine sand and dust, colored gray to black by charcoal and ash.

Features: (see fig. 1). Feature 1 was a concentration of ash and stones, 6 in. in depth and 21 in. in diameter, found 42 in. below the surface of Area A.

Feature 2 was a shallow basin 4 in. deep and 17 in. in diameter, dug into the slightly moist earth 29 in. below the surface of Area A. It contained charcoal, burned stones and two projectile points.

Feature 3, 2 ft. to the east of Feature 2, was a shallow pit excavated into the sand at a depth of 8 in. It was 16 in. in diameter, and was filled with charcoal, burned rocks, ashes and chips.

Feature 4 was an oval basin with its greatest measurements 1 by 3 ft. at its rim. It was situated in Area A next to a large roof-rock at a depth of 4 ft. The sides, 11 in. in height sloped slightly to the concave floor. This pit was overlain by a consolidated layer of ash and pebbles and was filled with a fine tan-colored sand. Two in. from its bottom lay a necklace of 110 complete and 8 fragmentary bone beads, and a bone pendant.

Feature 5 was a round pit, 6 in. in diameter and 4 in. deep. It occurred 4 in. to the north of Feature 4, and was overlain by the same consolidated material. Scattered through the fine sandy fill were 12 extremely small bone beads which may have been part

of an ornament such as a bracelet.

Feature 6 was a concentration of rocks, small stones, ash and charcoal, located in Area E. It was 14 in. below the surface, approximately 30 in. in diameter, and must have been a small hearth.

Site II

Site II (Porcupine Cave) is situated 40 yards to the northeast of Site I, facing almost due east. It is 38 ft. long with a maximum overhang of 24 ft. The ceiling is level and about 12 ft. high. A talus cone lies directly in front of the opening. The site contained two levels. The first, 8 in. thick, was composed of fine sand and gravel, and was sterile; the second from 1-10 in. in thickness was of dust, medium coarse sand, and gravel, colored brown to black by ash and charcoal.

Features: There was one feature in Site II. It was a concentration of ash and charcoal in an oblong area situated about 10 in. below the surface at the mouth of the shelter. It measured 15 x 30 in.

Site III

Site III (Fire Cave) is situated 10 yds. from Site I and would be considered a continuation of the latter if it were not that the fill differed slightly from that of Site I. Site III is 28 ft. long and has a maximum overhang of 18 ft. The arched roof is approximately 25 ft. high. There were three levels. The first, of sand and gravel, was sterile. The second, from 6-27 in. thick, was composed of medium coarse sand, dust, and gravel. It was colored brown to grey by ash and charcoal. The third, from 10-20 in. thick, brown to grey in color, was of ash, fine sand, and gravel.

Features: Feature 1 was probably a hearth. It occurred in Area B, and consisted of a round pit 3 ft. in diamater excavated into the clay and sand. It lay about 18 in. below the surface next to the back wall of Area B. In it were found ash, charcoal and the burned, decomposed remains of a log at least 6 in. in diameter. No artifacts were encountered, but there was a large number of agate flakes.

Artifacts: The artifacts of Sites I-III are sufficiently similar to be described together. The levels of artifacts whose distribution is significant will be noted.

Chipped Stone: Work in chipped stone was abundant at Sites I-III. The types of artifacts found were projectile points, scrapers, knives, drills, and utilized flakes. The predominant materials were agate and grainy quartzite but jasper, chert, calcedony and petrified wood were also found. Most of these can be secured within a radius of 100 miles. However, one piece of obsidian, a scraper from Site II, probably came from northern Wyoming.

There were 56 complete and 64 broken but classifiable projectile points. These were all bi-convex in cross-section and generally well made. They range in length from 15-29 mm., and in width from 12-17 mm.

The following results were found in a classification of points from the second level of Sites I-III. The material from the single cultural level in Site II seems to have closest relationship with that of the second level of the other two shelters so the artifacts from Site II were grouped with this level.

The projectile points of Level 2 occurred as follows:

Description	Type (Fig. 3)	Number by Site I	II	III	Total	Percent of Total
Triangular, straight base, 2 side notches	(NBa1)	28	7	2	37	40
Triangular, straight base, no notches	(NBa)	15	4	1	20	22
Stemmed, expanding stem, straight base	(SCa2)	6	2	2	10	11
Triangular, concave base, 2 side notches	(NBb1)	4	4	0	8	9
Triangular, concave base, no notches	(NBb)	5	2	1	8	9
Triangular, straight base, 1 side notch (Possibly unfinished)	(NBa1)	3	0	0	3	3
Triangular, straight	(NBa2)	2	0	0	2	2
	Totals	63	19	6	88	96

Level 3 gave these results:

Description	Type (Fig. 3)	Number by Site I	III	Total	Percent of Total
Triangular, straight base, 2 side notches	(NBa1)	6	2	8	38
Triangular, straight base, no notches	(NBa)	4	1	5	23
Triangular, concave base, no notches	(NBb)	3	0	3	14
Stemmed, expanding stem, straight base	(SCa2)	2	1	3	14
Triangular, concave base	(NBb1)	2	0	2	9
	Totals	17	4	21	98

From the above it may be seen that 85% were some variant of the triangular, unstemmed type. This dominance is characteristic of the Upper Republican culture, as at Lost Creek though that site showed more unnotched points.

Scrapers were not as plentiful as might be expected from their importance at other Upper Republican sites (Wedel, 1934). Side-scrapers, ovoid or irregular in form, with one or more well retouched edges, are the dominant type, with 17 distributed through all occupied levels. These range in size from 19x25mm. to 38x57mm. Workmanship is usually of good quality, but the flaking is most often confined to one edge. The 5 end-scrapers were found in Sites I and II. These are very well made, with a semi-circular working end and plano-convex cross-section. They range from 25-55 mm. in length and from 17-36 mm. in width. 5 bi-convex discoidal specimens were also found. Workmanship on these ranges from fine to crude. The diameter varies from 12-32 mm. These proportions are not characteristic of Upper Republican sites where the end-scraper is typical and the discoidal type rare or absent (Wedel, 1934, p. 234).

Nine knives were uncovered in the three sites. Of these 5 are ovoid (NAa), 3 diamond shaped (2NC, 1NCa) and one was triangular (NBa). This is the same order of occurence which obtained at Lost Creek. All of these specimens are rather well-made.

Of the 4 drills recovered, 2 are of the expanding base variety, similar to those from Lenses C and D at Ash Hollow Cave (Champe, 1946, p. 49-50). The other 2 specimens resemble side-notched projectile points (NBa1) with elongated tips. These tips are quite smooth from wear. They are 18x10 mm. and 20x12 mm. in length and width.

The final class of chipped stone is that of utilized flakes. These are common in Site I (23 recovered), but rare elsewhere, with 3 from Site III and none from Site II. They consist of rough, irregular flakes retouched lightly on one or two edges or showing use scars. The largest measures 38x55., the smallest 10x14 mm.

Ground Stone: The several artifacts of ground stone from Sites I-III are, with one exception, made of a fine, friable, dark brown sandstone which is not found within a 50 mile radius. The one exception is of micaceous schist. It is a fire blackened handstone, found among the burned rocks of Feature 2 in Site I. It is 85 mm. in diameter and 28 mm. thick, used only on one side and unpecked. The 3 fragments of grinding slabs were recovered from Level 3 of Site I. These pieces indicate rather round slabs, used on both sides, but unpecked. They range in thickness from 5-11 mm.

One abrader, a rectangular piece of sandstone 41x23 mm., was recovered. A groove 2 mm. deep and 9 mm. wide runs the length of one side.

Ceramics: (see Figs. 3, 4, 5) Ceramics were not abundant in comparison with other artifacts, with a total of only 125 sherds from all three sites. Three classes of sherds can be recognized, two related to the pottery of the Upper Republican culture, the other to that of the Woodland culture.

The first Upper Republican variety we have designated Owl Creek Fine Cord-Marked. This is represented by 96 sherds (9 rim sherds). The ware varies from gray to black throughout, and has no added coloring or staining. Texture varies. Most of the sherds are crumbly, but a few are flaky. Temper is of fine to medium sand or grit. All but one are cord-marked. Cord-marking and smoothing or polishing make up the surface finish. Sometimes the heavy smoothing obliterates the cord-marks. These are fine, narrow, two-ply cords running criss-cross or more or less vertically. Decoration is confined to the rim. Of the 9 rim sherds, 3 were collared and decorated by 3, 4 or 5 parallel horizontal lines incised on the collar. There also were deep diagonal paired incisions on the lips of all of these.

Five of the others were uncollared with flaring rims. Of these, 3 had paired diagonal incisions on the lip, one was plain, and the last was too fragmentary to describe. The remaining sherd has a vertical rim with deep indentations on the lip. All of the lips are rounded, and all indicate a sharp angle between the rim and shoulder. The sherds are from 3-5 mm. thick and have a hardness of from 3 to 4. A partially restorable vessel in this group suggests a globular shape with round bottom. Estimated dimensions are: mouth diameter-10cm.; greatest body diameter-25cm.; height, uncertain. One sherd has a conical hole drilled through it. It was probably made in mending a crack. The general character of the ware is reminiscent of that of the Lost Creek Focus.

Owl Creek Rough Cord-Marked is the second Upper Republican ceramic type, represented by 31 sherds (including 5 rimsherds). The pottery ranges from black through grey to a buffish brown or red (the latter on 2 sherds, probably refired). About 20% are flaky, the rest crumbly. The tempering material is more abundant than in the first category and is of medium to very coarse sand. Cord impressions are present on all but 2 sherds which seem to be basal. These cord impressions are parallel and vertical and quite coarse. Polishing is present on 75% of the sherds, but nowhere reaches the degree found on other Upper Republican ceramics (Strong, 1935; Wedel, 1934). The pieces range from 5-9 mm. in thickness and have a hardness of about 3. Three of the rim sherds have small lug-like modelled undulations of the rim, and paired diagonal incisions on the lip. Of the remaining 2, one,that of a restorable vessel, is plain; the other vertical with deep indentations on the lip. The lips of all except the last are rounded. The exception has a flat lip. The restorable vessel is about 4 cm. high with a mouth diameter of 7 cm. and a maximum body diameter of 9 cm. It is thick, 7-9 mm., globular in shape with a flaring rim, and may have been a miniature vessel or a small bowl.

The third ceramic type is of Woodland affiliation. The authors have designated it Agate Cord-Marked, but it is very similar to Ash Hollow Cord Roughened, being different in only a few details such as thickness. At these sites this ware is represented by only 17 sherds (6 rim sherds). The color is black to buff. However, 7 sherds from

Site III present a reddish surface, extending into the sherds about a millimeter. These latter sherds have a crumbly, friable consistency, probably from overfiring. The other 6 are more durable, but are also crumbly. Hardness varies from 3 to 4. Fine to medium or medium/coarse sand and mica were used as tempering. Cord-markings, having a width of about 3 mm. with an "s" twist, are present on all sherds and are vertical, or slightly diagonal; none are polished. There is no decoration, but cord-markings usually continue diagonally across the flattened lip. The 6 rim sherds are all straight or very slightly flaring. However, 4 of these were from one vessel from Site III. Though no restorable pieces were recovered, the camber of the larger sherds is similar to that of tall, pointed-bottom pots. The sherds also indicate fairly large vessels with very little shoulder.

Provenience of the three types of sherds was as follows:

Level 2	Site I	Site II	Site III
Owl Creek Fine Cord-marked	35	15	9
Owl Creek Rough Cord-marked	7	12	4
Agate Cord-marked	2	0	2
Level 3			
Owl Creek Fine Cord-marked	30	--	7
Owl Creek Rough Cord-marked	6	--	2
Agate Cord-marked	5	--	4

Work in Bone: Tubular beads can be divided into 2 groups. The first is a short form, ranging in length from 5-7 mm. and in width from 10-14 mm. They are well smoothed and polished with rounded ends. Of these 118 pieces were recovered from Feature 4. The remaining 2 specimens, which had slightly thinner walls, were found in Area E.

The other category consists of 5 incised beads fashioned from bird limb-bones. These have incisions ringing them at intervals of about 5 mm. There are about 5 of these per bead. The beads range from 5-16 mm. in length. Almost identical specimens appear at Holdredge I and other sites of the Lost Creek Focus.

Twelve extremely small discoidal beads were uncovered in Feature 5. These were made from thin pieces of bone with a hole drilled in the center of each. They range in diameter from 4-5 mm. and are from 1 1/2-2 mm. thick.

Of the 3 awls found, 2 are of the splinter types. These are 68 and 70 mm. in length. Both are unworked except for the tip. One is extremely sharp, the other dull. The third, made from a deer metapoidal, has overall polish and is well-worked. The tip is rather blunt and the artifact is 92 mm. long.

A flat rectangular piece of bone, broken at one end, appears to have been a scoop. Its sides are parallel and a shallow hollow has been gouged out of one face. The end is flat and it is 12 mm. in width with an estimated length of 55 mm.

A flat piece of bone in the shape of a projectile point (NAb2) may have served that purpose. It is well polished, probably made from a piece of rib-bone. It is broken at the base, but the length can be estimated at about 33 mm. A bone pendant, 54x12 mm. was found with the beads in the first cache. It is flat, polished, with a hole drilled three-fourths of the way from one end to the other. An object believed to have been a hide-tanning tool with the form of an elongated rectangle, 120x14x9 mm, was found in Site II. It is very well worked and polished, probably from use, but somewhat decomposed. The final bone object is a tabular specimen with a rounded end. Though its use is unknown it probably was part of a hide-working tool.

Shell: (Species - Fresh water clam (Lampsilis ventricosa bernes) A piece of shell in the form of a rectangle, 12x32 mm. with rounded corners, and smoothed side was found in Area A, Site I. Near one end are 2 small notches. It was undoubtedly an ornament of some sort, perhaps a pendant.

A large fragment, irregular in shape and smoothed along one edge, probably from use, was found also in Site I. It was possibly employed as a scoop or scraper. It was about 50 mm. in diameter.

Floral Remains: Though in the upper level occasional twigs and bits of decayed grass occurred, none of these were large enough to identify. Throughout the fill quantities of charcoal was found and sacked in plastic bags. In addition to these items, one kernel of Dent corn was found 4.5 ft. beneath the surface in Area A below a large fallen roof rock in Site I. It is 12 mm. in length, 9 mm. in width. According to Manglesdorf it shows similarities to the specimens from Basket Maker sites and to corn found in the Ozark area in both prehistoric and historic contexts. It is highly improbably it was carried in by a rodent since no corn is grown within a radius of 20 miles.

Faunal Remains: The deposit contained numerous animal bones, which were identified by Dr. A. G. Beidleman. Most abundant remains were buffalo and elk. The following animals were represented: Bison (buffalo); Cervus (elk); Geomys (eastern pocket gopher); Antilocapra (pronghorn); Sylvilagus (cottontail); Canis (coyote rather than dog); Odocoileus (mule deer); Cynomys (prairie dog); Gallinaceous bird bones unidentified further; Ursus (grizzly bear?) tooth.

Site IV

Site IV (Woodland Cave) is situated about 250 ft. west of Site I. The rock shelter is 54 ft. long and has a maximum overhang of 22 ft. It faces southeast and has a rather flat ceiling about 15 ft. high. Site IV contained 3 levels; the first of gravel and sand was 7-9 in. thick, and was sterile. The second from 10-24 in. thick, was of medium coarse dry sand, gravel and dust, colored light grey by charcoal and ash. The third, separated from the second by a thin, light colored band of soil, was of moist fine sand and dust, colored dark brown to black by fire remains, and was from 20-28 in. thick.

Features: (See Fig. 2) The 2 features encountered in Site IV were both round basins, presumably firepits. Feature 1 was located in Area B and was 3.5 ft. in diameter and 18 in. deep. The major portion lay in the second level, but it extended a maximum depth of 5 in. into the underlying sand of the third level. A fragment of a grinding stone was recovered from the fill of charcoal and burned stones.

Feature 2, located in Area A, was 3 ft. in diameter and 1 ft. in depth. It lay approximately half in the first level and half in the second. The fill, of ash, charcoal and blackened rock, included 2 broken projectile points and one fragment of a grinding slab.

Artifacts of Site IV

Chipped Stone: The rather numerous chipped stone artifacts of Site IV were predominantly of agate and grainy quartzite. Projectile points were quite common in Site IV, and are typed according to size and form. The first class consisted of 53 specimens, which range in length from 14-27 mm. and in width from 11-16 mm. All are bi-convex in cross-section and are moderately well made.

In Level 2 the following types are represented:

Description	Type	Number	Percent
Expanded stem, shouldered, straight base	(SCa2)	13	39
Expanded stem, shouldered and barbed, straight base	(SCb2)	7	21
Triangular, straight base, no notches	(NBa)	6	18
Triangular, concave base, no notches	(NBb)	4	12
Triangular, straight base, 2 side notches	(NBa1)	2	6
Triangular, straight base, 2 side notches, 1 basal notch	(NBa2)	1	3
	Total	33	99

In Level 3 the following results were obtained:

Description	Type	Number	Percent
Expanded stem, shouldered, and straight base	(SCa2)	6	30
Expanded stem, shouldered and barbed, straight base	(SCb2)	3	15
Triangular, straight base, no notches	(NBa)	5	25
Triangular, concave base, no notches	(NBb)	4	20
Triangular, straight base, 2 side notches	(NBa1)	2	10
	Total	20	100

The above table shows a preponderance of stemmed points like those found at Vy-1 and other Nebraska Woodland sites (Hill and

Kivett, p. 170; Kivett, 1952b, p. 17).

The one point with 2 side notches and a basal notch is of a type usually associated with the Upper Republican culture and here may have been intrusive. However, as Kivett has suggested (1952a, p. 18) a small number of these points may have been made by the Woodland people.

The 5 specimens in the second class are of interest because of their size and location. All are expanding base, stemmed points, shouldered and barbed, with straight or slightly convex bases (SCb2). They are rather thick, less finely worked relative to the other points and range in length from 30-50 mm. with an average of 40 mm., and in width from 19-32 mm. with an average of 26 mm. All were found in the third level. It seems possible in view of their size, greater weight, and location in the site, that these were dart rather than arrow points.

19 side-scrapers with only one side retouched were recovered. These are moderately well made and range from 20-50 mm. in length, and from 19-35 mm. in width. Plano-convex end-scrapers are the next most numerous form in this category. These are finely worked and "keeled" (having a sharp ridge running the length of the dorsal side and sloping to the retouched edges) and the working ends are semi-circular. They range in length from 19-35 mm. and from 14-25 mm. in width. A fairly large specimen (18x20 mm) was found, stemmed with a rounded bit. It resembles the base of a large projectile point. Although it is possible that this was used as a stunner, the shape and polish on the bit suggest that it was a scraper. Kivett reports the occurrence of 2 of these at the Massacre Canyon Site. He notes the similarity of these tools to a form common at the Renner Site (Kivett, 1952a, p. 18; Wedel, 1943, p. 53).

30 chipped stone knives were recovered, all bi-convex in cross-section. The workmanship varies from medium to extremely fine. All are ovoid (NAa, or NAb1) in shape; none are diamond shaped, similar to Vy-1 (Hill and Kivett, p. 172). They range from 35-50 mm. in length and 20-35 mm. in width.

25 tools whose function is not clear were found. These are triangular with convex bases, and concavo-convex to bi-convex in cross-section. They range in length from 14-24 mm. and in width from 13-17 mm. They are generally well made, and were probably used as perforators or small knives. One drill with an irregular expanding base was recovered. The specimen is 9x14 mm.

There are 153 utilized flakes, showing retouch or use, which range from 20-67 mm. in length and from 15-40 mm. in width. Three rounded, coarsely made choppers were recovered. These are bi-convex in cross-section, and range from 90-100 mm. in diameter and from 27-50 mm. in thickness. One specimen shows evidence of pecking.

Ground Stone: There were several examples of ground stone artifacts.

All are made of a fine-grained sandstone not found within a 50 mile radius. 2 handstones were found, both in Level 3. One is round, 145 mm. in diameter, bi-convex in cross-section and worn only on one face. There is no evidence of pecking apparent. The second specimen is also bi-convex in cross-section and is triangular in form. It is worn on both faces with no evidence of pecking.

Eight fragments of grinding slabs were recovered, 3 in Level 2 and 5 in Level 3. In thickness they range from 10-30 mm. 3 specimens show use on both sides. The largest fragment is an unpecked rectangular slab with a slight depression. In general, the slab fragments are similar to those from Ash Hollow Cave (p. 40).

Two abraders were found. One, of coarse sandstone, has 3 longitudinal grooves. The other is of fine sandstone with 2 longitudinal grooves. The grooves are 8-10 mm. wide and 2-4 mm. deep. A small semi-spherical piece of sandstone with a depression on one side contained pulverized yellow ochre. The stone is believed to have been used in grinding this substance. It measures 9 mm. in diameter and the depression is 1 mm. in depth. 3 irregular lumps of ochre were found, 1 red, the others yellow. They are about 9 mm. in diameter.

Ceramics: (See Figs. 3, 4) 19 sherds (5 rim sherds) belonging to the type designated Agate Cord-marked in Sites I-III were found. The thickness of the pieces varies from 4-9 mm., the majority 7 mm. In other respects the construction is similar to that previously described. The surface is covered with medium cord impressions. 3 of the rimsherds are straight and have flattened lips; on 2 this has caused a slight thickening. On one of these rimsherds the cord-marking continues from the body over the lip; the other 2 are amorphously grooved and marked and have thickened lips. The remaining 2 rimsherds are flaring, have rounded lips without marking. On these the cord-marking is diagonal. Vessels, as indicated by these sherds, were large and unshouldered, probably with a conoidal base. 10 of the sherds were recovered from Level 2; 9 from Level 3.

The other ceramic type represented at Site IV conforms generally to the description of Owl Creek Fine Cord-Marked. There are 11 sherds (3 rimsherds) of this variety all from Level 2. All 3 rimsherds are collared, 2 have 3 parallel horizontal lines incised on the collar, with rows of punctations on both sides of the lines. The other sherd is similar, but the punctations are lacking.

Bone Artifacts: Ten beads were found at Site IV. 6 are made of short tubular bones, polished and thin-walled. They range in length from 1 1/2-3 mm. and in width from 8-18 mm. Two long tubular beads measure 30 mm. in length x 15 mm. in diameter and 14 mm. in length x 7 mm. in diameter respectively. All were made from mammal bones. A single discoidal-shaped bead was recovered. It appears to have been made from a flat rib bone of a mammal, then drilled in the center. It measures 2 1/2 mm. in thickness and 6 mm. in diameter. A modified root of a bison tooth was also made into a bead. The ends are rounded and the natural hole in the root enlarged. It shows no polish and

is 7 mm. in diameter x 18 mm. in length. The long tubular beads are similar to those found at Vy-1 site and at Ash Hollow Cave. The short type does not appear in either of the above sites and may be a local form (Champe, 1946, p. 41; Hill and Kivett, p. 165).

Nine splinter awls or perforators were recovered. On 8 of the specimens work was confined to the tip; the ninth was smoothed all over and the butt-end was rounded and flattened. They range in length from 40-75 mm. Two pieces of bone appear to have served as hide-working tools. The first specimen is 20x100 mm., smooth on both sides, rectangular in cross-section and round on one end. The other is 30x140 mm., smooth on both sides, rectangular in cross-section and rounded on both ends. Two flat pieces of bone (possibly gaming pieces) were found. The first is oblong, smoothed all over and is 9x33 mm. The corners are slightly rounded. The second is round, smoothed all over and is 11 mm. in diameter. Neither shows any cancellous tissue but may have been made from rib bones. There is no decoration on either piece.

A flat, slightly curved section of an elk rib-bone, 160x18 mm., appears to have been used for smoothing or cutting. The outer surface is highly polished from use. The natural shoulder or edge has been abraded leaving a section about 45 mm. This has been sharpened, as is evidenced by numerous scratches on the bone probably made by a sandstone abrader. The specimen fits into the hand and would have served as a cutting instrument. A similar flat piece of bison bone was found at Ash Hollow Cave (p. 42). The distal end of a deer metapoidal was found. This bone has a groove 2 mm. deep around it and 2 grooves running length-wise on either side (about the same depth) probably in prepraration for splitting for making awls.

Perishable Materials: (Fig. 5). There are 2 types of arrow-shaft fragments. The first type (3 specimens) is a straight piece of wood with the bark scraped off and with tiny spiraling grooves over a portion of its length. Two were found in Level 2, the other in Level 3. They range in diameter from 2-8 mm, in length from 19-32 mm.; the grooves are about 1 mm. deep. There are about 16 grooves per centimeter. Every indication points to the conclusion that these are from the ends of the shafts where sinew was employed to bind the feathers or points in place. Such sinew binding would leave the spiral markings described.

The second type of arrow-shaft fragment (3 specimens) is a straight piece of wood with the bark scraped off, without the spiral markings but with a wide groove running irregularly along the length. The 3 fragments range in length from 30-68 mm. and from 7-10 mm. in diameter. The grooves are about 0.2 mm. deep and about 1 mm. wide. These grooves are almost identical to those found on the shafts of some historic Plains arrows. The fragments fit readily into the abraders found at this site which, it is believed, were used to smooth such shafts.

A small fragment of yucca fiber rope was found in Level 3. It

is composed of 2 strands (about 2 mm. in width) twisted about each other in an "s" twist. Its length is about 50 mm. A small piece of yucca, flattened and bent in a series of waves closely resembling a strand of simple plaited basketry, was found in Level 2. It is 12 mm. in length, 2 mm. in width and .7 mm. in thickness.

Shell: One fragment of nacre, the size and shape of a penny, with 1 edge broken was found. The remaining part shows smoothing and rounding.

Floral Remains: The following plant remains were recovered: The leaf and fruit head of a sunflower (Similus); the leaf of a wax currant bush (Nibus cenunis); The base and stem of a wild grape leaf (Vitis sp.); several yucca seeds and stems. Identification was made by Dr. Joe Ben Wheat. Of this floral inventory only the sunflower and yucca are present in the area today. With the exception of the sunflower and the yucca seeds (which were found in Level 3) the floral remains were found in Level 2. Scattered in the fill were a number of twigs and pieces of decayed wood. The pieces were too small for identification but appear to have been from scrub pine and bushes. Several handsfull of grass were found concentrated in one place, perhaps being a padding of some sort.

Faunal Remains: Numerous animal bones were found throughout the fill and were identified by Dr. Beidleman as follows: (listed in order of frequency) Bison (buffalo); Cervus canadensis (elk); Antilocapra (pronghorn); Cynomys (prairiedog); Neotoma (Woodrat or packrat); Odocileus (mule deer). Buffalo and elk remains were far more numerous than any of the others. The predominance of buffalo remains over antelope is interesting in view of the more frequent occurrence of smaller animals in Woodland sites in Nebraska (Kivett, 1949a, p. 283;) but is in accord with the faunal report on Ash Hollow Cave (Champe, 1946, p. 43). The heavy dependence on elk, an animal usually not found in Woodland sites in Nebraska, is probably due to regional variation of the animals. Perhaps the predominance of buffalo at both Ash Hollow Cave and Owl Creek was due to the same cause.

Conclusions

Investigations at Agate Bluff on Little Owl Creek reveal that this area had been inhabited by two distinct cultural groups, both showing affiliations to the east.

The bulk of the material from Sites I-III proved to be most closely related to the Upper Republican Aspect as defined by Strong (1933, p. 278). The diagnostic elements shared with this Aspect include ceramic inventory, projectile point types, small end and side scrapers, oval and diamond-shaped knives, chipped stone celts, hammerstones, bone beads and awls, shell beads, T-shaped drills, and the absence of grooved axes and catlinite. All of these traits, with the exception of the ornaments, are of a simple functional nature, adapted to a culture based on hunting and gathering rather than on sedentary agriculture. Other, more refined and elaborate elements,

characteristic of Upper Republican sites farther east, are absent. Foremost among them are pipes, boat-shaped shaft-smoothers, fish-hooks, scapula hoes, bone shaft straigtheners, shell and antler bracelets, copper ornaments and perforated clay discs. The absence here of earth lodges is not conclusive, because of the presence of excellent local rock-shelters. Though the area was thoroughly explored, no evidence of ossuaries was reported.

Grinding slabs, very rare at other Upper Republican sites, are present here. Similar objects were recovered from sites in Ottawa County, Kansas, and were attributed to possible Southwestern connections (Wedel, 1934, p. 134, 135). Here (Agate Bluff) the phenomenon may be satisfactorily explained by the influence exerted by contemporary Woodland peoples in the area. Another similar artifact was found in Ash Hollow Cave (p. 49) in Lens C, with mixed Upper Republican-Woodland associations.

The identification of a focus for the Agate Bluff materials, Sites I-III, must remain somewhat tentative. The closest affiliationsto a single site are to Ash Hollow Cave. The absence of many complex traits, the occurence of grinding stones and short tubular beads all follow this hypothesis. Subsistence seems to have varied slightly. At Agate Bluff the elk, rather than the antelope, with the bison is the primary object of the chase. Fishhooks were found only at Ash Hollow. There is no evidence of agriculture at Ash Hollow. The single kernel of corn recovered from Site I, suggests that agriculture may have been practised, though lack of hoes and other evidence beyond this single object hardly indicate a basic resource. Ornamentation here was much more abundant than at Ash Hollow, as seen in the contents of 2 caches and the beads and pendants scattered through the fill. Worked shell is present here, absent at Ash Hollow. The ceramic remains are on the whole very similar to those of the latter site, though the sherds tend to be somewhat thinner. The types fall within the range of those of the Lost Creek Focus, to which Champe tentatively assigned the Upper Republican lens at Ash Hollow Cave. Similar material has been reported from Signal Butte (Strong, 1935, p. 299) and several sites along the Prairie Dog, Medicine, Willow, and Rebecca Creeks and other tributaries to the Upper Republican River (Wedel, 1934). The cord decorated rims characteristic of the Sweetwater Focus (Champe, 1936, p. 270) are absent.

A certain amount of material has been recovered from Colorado, but almost no published data is available. Withers (p. 2,3) has named a Buick Focus occuring on the South Platte and Republican River drainages. The only diagnostic trait described is the pottery type."...squat round bottomed jars which are cord-marked and here have an out-curved rim. The rim is thickened to form a "collar" and incised geometric designs are placed on these." (p. 2). To the authors this appears to be Lost Creek type pottery, but Withers correlates it with the Sweetwater Focus. A more complete description of the material must be made before the issue can be clarified. The relation of the Little Owl Creek sites with this southern Colorado

Focus must remain obscure until data from these is recorded. The early surveys of Renaud (1931, 1932, 1933) reveal the widespread occurrence in eastern Colorado of "stamped" (i.e. cord-marked) pottery, which may belong to either the Upper Republican or Woodland cultures. Exact identification must await investigation.

On the whole, the material from Sites I-III suggests a marginal representation of a sedentary culture, adapted here to a more nomadic hunting-gathering pattern and stripped of many of the refinements of its eastern parent. Thus is seen, in an east-west direction, the Upper Republican culture grading from the complexities gained in mingling with the higher cultures of the East (at the St. Helena Focus, Cooper, 1936) through the basically sedentary but simple villages of the Nebraska loess plains toward an increasing simplification and reorientation to a hunting and gathering economy on the High Plains of western Nebraska and eastern Colorado.

The total range of years for the Upper Republican lenses in the tree-ring sequence from Ash Hollow Cave is from 1210-1517 A.D. (Champe, p. 49). It seems probable that the present material falls within this range. The lack of any Dismal River and Late Upper Republican types (such as the type "Z" Sweetwater-like pottery of Lens B in Ash Hollow) as well as the intrusive Woodland materials in all the levels, indicate an early date.

The people at Site IV appear to have been simple hunters and gatherers. As in most western Woodland sites there is no evidence of agriculture. Whether there was any or not, certainly its importance must have been most limited.

At Site IV two cultural levels were encountered. These were separated by a thin sterile zone (1/2 in. thick), apparently indicating brief abandonment. However, a general thinning out of the quantity of artifacts as depth increased was noted. This is especially apparent in comparing the total materials from the two levels. Also in the top level certain Upper Republican artifacts were unearthed. The relationship of these to the other sites and to Site IV itself will be discussed below.

The material recovered in the excavation of Site IV is of an interesting nature. Its obvious affiliation is with the Orleans Aspect of the Woodland culture. Pottery, projectile point types, ground stone, all point to this. The nature of its specific affiliations is a more complex and difficult question. The closest site in material inventory is Ash Hollow Cave Lens D. Pottery in many instances is most similar. Projectile point comparisons reveal a higher percentage of corner-notched stemmed varieties (Strong's "S" series) at Site IV. Work in bone is comparable, Site IV containing a more extensive inventory. At both sites there is evidence of grinding slabs.

Nevertheless this rather close affiliation of Site IV with its near neighbor, Ash Hollow Cave, is only a part of the problem.

Kivett in reporting on the Kelso Site, a site in the Sand Hills region of Nebraska (1952, p. 66) determined that Kelso was a close relative of Ash Hollow (Lens D), and believed that sites of this nature belonged to an unidentified focus of the Orleans Aspect. However, in referring to the rather scanty materials from the site, he decided that the evidence for the designation of a new focus was not adequate. It must be clear now that Site IV of Owl Creek is one of the sites of this type. However, the work at Site IV not only broadens the picture in terms of the artifact inventory (including perishable materials) but also shows that the particular association of traits and pottery type pointed out by Kivett is no local phenomenon. On the basis of its distinctive qualities we believe it should be designated the Ash Hollow Focus following Kivett's tentative suggestion.

As Kivett and others have pointed out, the sites of the Ash Hollow-Kelso-Agate Bluff type share traits with several Woodland foci on the Plains. Notable among these are specifically the Keith and Valley Foci. There are several traits found in the Ash Hollow type site that appears in one of these but not the other. Thus culturally the Ash Hollow sites are affiliated with both of these foci but not exclusively with one or the other. The most important comparisons are those of ceramics. In many respects the Ash Hollow type pottery looks similar to that of the Valley Focus, but it lacks the nodes and punctates, cord wrapped rod impressions and other decoration common to the sherds of Vy-1 (Kivett, 1952, p. 37; Hill and Kivett, 1940, p. 172-73). The Valley Focus pottery, on the other hand, lacks the thickened lips (for cord impression) common at sites of the Ash Hollow type. Fewer differences exist between it and the Keith Focus sites. The former lack fabric or cord impressions on the interior. However, at Kelso and at Agate Bluff a minority of sherds appear with cord-impressions running diagonally to the lip. There is no such occurrence in the Keith sites. Pottery of the Ash Hollow sites is generally thinner than that at Keith. It is interesting to note in this connection that the pottery at Agate Bluff is thinner than that of either Ash Hollow or Kelso, being in this respect similar to that at Vy-1. In projectile point types, Owl Creek and Ash Hollow approximate the inventory of Vy-1 with about 40% stemmed, 30% side-notched and the others stemless. At the Woodruff Ossurary and other sites of that nature such as the Guide Rock Site, all of the points were stemmed (Kivett, 1952b, p. 129). At none of the above sites were the diamond shaped knives characteristic of the Upper Republican culture found.

Shell, abundant in the fill of Vy-1, seemed to be little used for artifacts. Of course, shell ornaments were numerous at Woodruff. Some few shell beads were recovered from Ash Hollow, but these are unstudied. Agate Bluff reports only one occurrence. This, despite the fact that shell fish are not scarce in the Little Owl Creek region, and could have been easily transported had they been valuable for ornaments. In this respect these sites seem to align themselves with Vy-1.

Both Ash Hollow and Agate Bluff report some grinding tools. Though sites of the other 2 foci do not report these, they do occur in the general area, for instance at the Massacre Canyon Site (Kivett, 1952a, p. 20).

Finally, a short stubby bone bead type found at Ash Hollow and Agate Bluff seems to be peculiar to them. In addition all others discussed report tubular beads as do Ash Hollow and Owl Creek.

Farther south in Colorado, Withers has excavated some sites of Woodland nature. He has designated 2 foci. The published accounts of this work consist of a few brief summaries and will have to be fully presented before any affiliations between these sites and Agate Bluff can be established.

In setting a date for the Agate Bluff material one must be guided by Champe's analysis of the dendrochronology in Ash Hollow Cave. In Lens D a date of 1000-1150 A.D. was indicated. The Woodland material of Ash Hollow Cave extended into Lens C but Champe regards the Upper Republican peoples as the primary occupants of Lens C (p. 50). Allowing an additional 50 years this might stretch the Woodland occupation to 1200. This date is not out of line with a recently published age on one of Wither's sites (Hunt, 1954, p. 114) of 800 $\pm$ 150 years A.D. However, considering the similarities between the foci, it is somewhat out of line with a date of 611 $\pm$ 240 A.D. obtained for the Woodruff Ossuary (Wedel and Kivett, p. 415).

The value of Site IV in Plains archeology can be summarized briefly. First, it presents a relatively clear picture of the artifact inventory of the particular culture which a stratified site often fails to do. Second, there are enough intrusive artifacts from a nearby Upper Republican site to allow some interesting comparisons. Third, the artifact inventory was fairly extensive, including some perishables rarely found in Woodland Sites on the Plains.

The treatment of the material from the Agate Bluff Sites has thus far been under two rather rigid divisions. The occurrence of a certain amount of mixture in the sites between the cultures presents the problem of their interrelationships and temporal correlation.

In all occupation levels of Sites I-III there was some admixture of Woodland-like material, e.g. stemmed points, Agate cord-marked pottery, with the predominant Upper Republican artifacts. The highest occupied level of Site IV (Level 2) showed an infusion of Upper Republican artifacts. At the surface a sterile layer of approximately the same thickness was encountered in all the sites truncating respectively Upper Republican and Woodland material. One possible interpretation of this stratigraphic evidence is as follows:

The first ceramic-using group to inhabit the area was one of Woodland affiliation whose occupation seems to have been confined primarily to Site IV. During the latter part of this occupancy,

they were joined by a larger Upper Republican group which appropriated Sites I-III and several other small overhangs in the Bluff (demonstrated by material recovered by local collectors). The problem of why and when sites were abandoned is not yet solved. The similar depth and character of the sterile overburden and the consistency of the presence of Woodland materials in Sites I-III would seem to indicate that this was simultaneous with both groups. However, such cross-site stratigraphic correlation is at best uncertain. Also such an interpretation would postulate a very late survival of Woodland type material.

In the vast area of eastern Colorado, western Nebraska, and southern Wyoming many sites of this nature must be dug before even the elementary steps of taxonomic classification can be accomplished.

REFERENCES CITED

Bell, Earl H. (editor)

1936 Chapters in Nebraska Archeology, Vol. 1.

Champe, John L.

1936 "The Sweetwater Culture Complex", Chapters in Nebraska Archeology, pp. 249-299.

1946 Ash Hollow Cave. A Study of Stratigraphic Sequence in the Central Great Plains. Univ. of Nebraska Studies, No. 1.

Cooper, Paul

1936 "Archeology of Certain Sites in Cedar County", Chapters in Nebraska Archeology, pp. 5-145.

Hill, A. T. and M. F. Kivett

1940 "Woodland-like Manifestations in Nebraska", Nebraska History, Vol. XXI, No. 3, pp. 146-243.

Hunt, C. B.

1954 "Pleistocene and Recent Deposits in the Denver Area", U. S. Geological Survey, Bul. 996-C.

Kivett, Marvin F.

1952a "The Woodruff Ossuary, A Prehistoric Burial Site in Phillips County, Kansas", River Basins Survey Papers, No. 3. Bureau of American Ethnology, Smithsonian Institution, Bul. 154.

1952b Woodland Sites in Nebraska. Nebraska State Historical Society Publications in Anthropology, No. 1.

they were joined by a larger Upper Republican group which appropriated Sites I-III and several other small overhangs in the Bluff (demonstrated by material recovered by local collectors). The problem of why and when sites were abandoned is not yet solved. The similar depth and character of the sterile overburden and the consistency of the presence of Woodland materials in Sites I-III would seem to indicate that this was simultaneous with both groups. However, such cross-site stratigraphic correlation is at best uncertain. Also such an interpretation would postulate a very late survival of Woodland type material.

In the vast area of eastern Colorado, western Nebraska, and southern Wyoming many sites of this nature must be dug before even the elementary steps of taxonomic classification can be accomplished.

REFERENCES CITED

Bell, Earl H. (editor)

1936 Chapters in Nebraska Archeology, Vol. 1.

Champe, John L.

1936 "The Sweetwater Culture Complex", Chapters in Nebraska Archeology, pp. 249-299.

1946 Ash Hollow Cave. A Study of Stratigraphic Sequence in the Central Great Plains. Univ. of Nebraska Studies, No. 1.

Cooper, Paul

1936 "Archeology of Certain Sites in Cedar County", Chapters in Nebraska Archeology, pp. 5-145.

Hill, A. T. and M. F. Kivett

1940 "Woodland-like Manifestations in Nebraska", Nebraska History, Vol. XXI, No. 3, pp. 146-243.

Hunt, C. B.

1954 "Pleistocene and Recent Deposits in the Denver Area", U. S. Geological Survey, Bul. 996-C.

Kivett, Marvin F.

1952a "The Woodruff Ossuary, A Prehistoric Burial Site in Phillips County, Kansas", River Basins Survey Papers, No. 3. Bureau of American Ethnology, Smithsonian Institution, Bul. 154.

1952b Woodland Sites in Nebraska. Nebraska State Historical Society Publications in Anthropology, No. 1.

Renaud, Etienne B.

1931 Archaeological Survey of Eastern Colorado. Univ. of Denver, Department of Anthropology. June.

1932 Archaeological Survey of Eastern Colorado. Univ. of Denver, Department of Anthropology. March.

1933 Archaeological Survey of Eastern Colorado. Univ. of Denver, Department of Anthropology. March.

Strong, William D.

1933 "The Plains Culture Area in the Light of Archeology", American Anthropologist, Vol. 35, No. 2, pp. 271-287.

1935 An Introduction to Nebraska Archeology. Smithsonian Institution, Miscellaneous Collections, Vol. 93, No. 10.

Wedel, Waldo R.

1934a "Contributions to the Archeology of the Upper Republican Valley, Nebraska", Nebraska History, Vol. 15, No. 3.

1934b "Minneapolis I: A Prehistoric Village Site in Ottawa County, Kansas", Nebraska History, Vol. 15, No. 3.

1940 "Cultural Sequence in the Central Great Plains", Smithsoni Miscellaneous Collections, Vol. 100, pp. 291-352.

1943 Archeological Investigations in Platte and Clay Counties, Missouri. U. S. National Museum. Bul. 183

Wedel, Waldo R. and M. F. Kivett

1956 "Additional Data on the Woodruff Ossuary, Kansas", America Antiquity, Vol. 21, No. 4, pp. 414-416.

Withers, Arnold M.

1954 "University of Denver Archaeological Fieldwork", South-western Lore, Vol. 19, No. 4, pp. 1-3.

Cambridge, Massachusetts

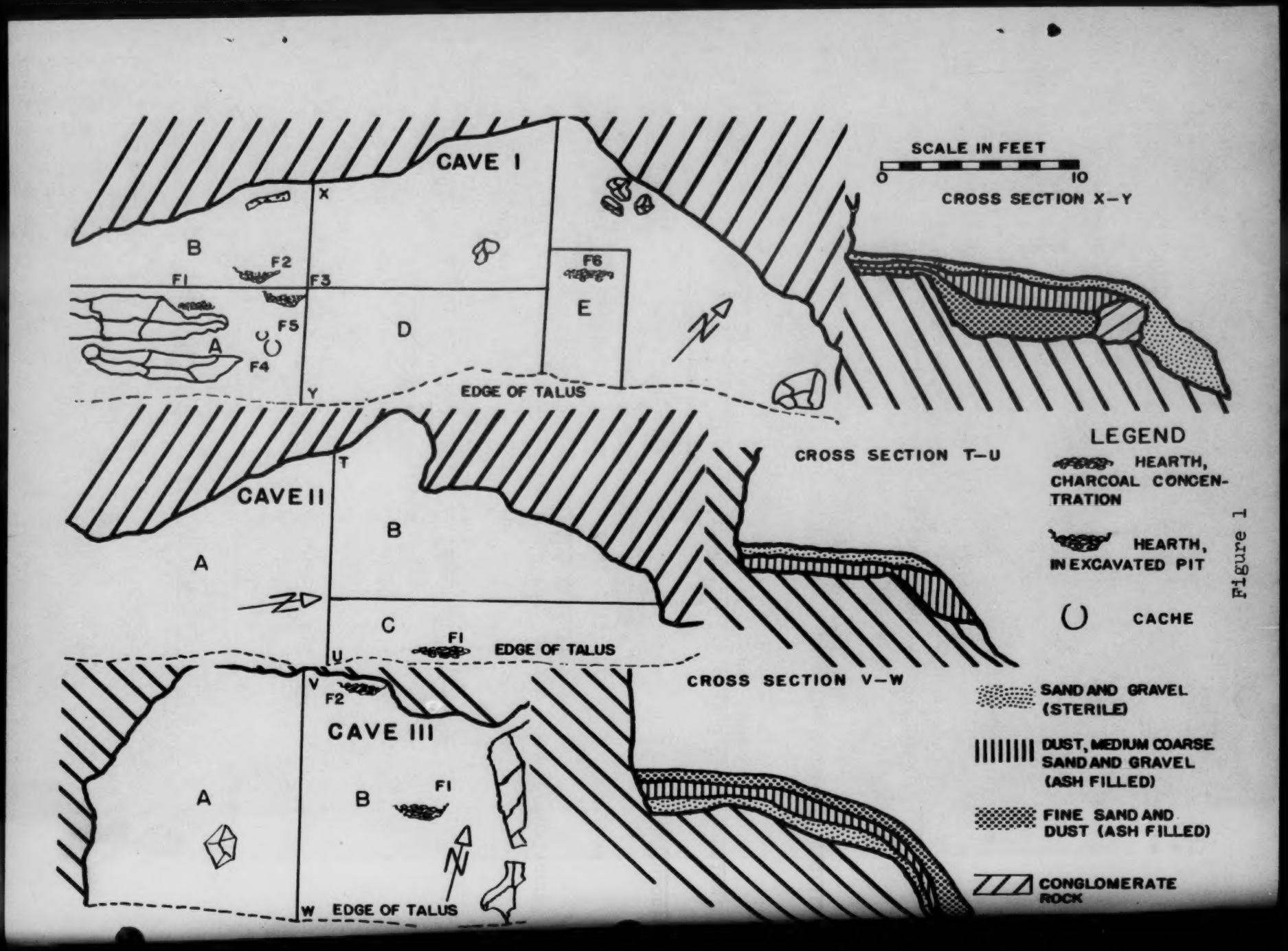
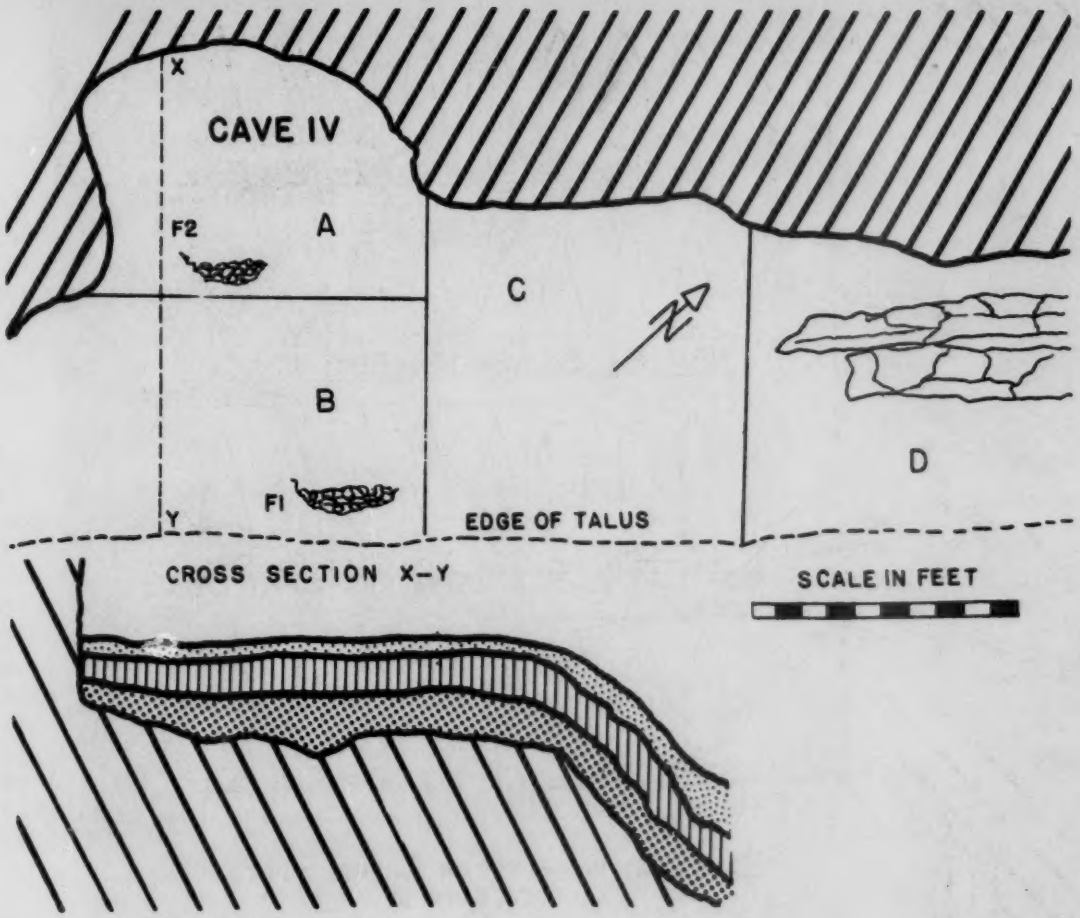

CAVE I
X
B
F2
F1
F3
F6
E
D
F5
A
F4
Y
EDGE OF TALUS
SCALE IN FEET
0
10
CROSS SECTION X–Y
CROSS SECTION T–U
CAVE II
T
B
A
C
F1
U
EDGE OF TALUS
CROSS SECTION V–W
V
F2
CAVE III
A
B
F1
W
EDGE OF TALUS
LEGEND
HEARTH, CHARCOAL CONCENTRATION
HEARTH, IN EXCAVATED PIT
CACHE
SAND AND GRAVEL (STERILE)
DUST, MEDIUM COARSE SAND AND GRAVEL (ASH FILLED)
FINE SAND AND DUST (ASH FILLED)
CONGLOMERATE ROCK

Figure 1


X
CAVE IV
F2
A
C
B
D
F1
Y
EDGE OF TALUS
CROSS SECTION X–Y
SCALE IN FEET

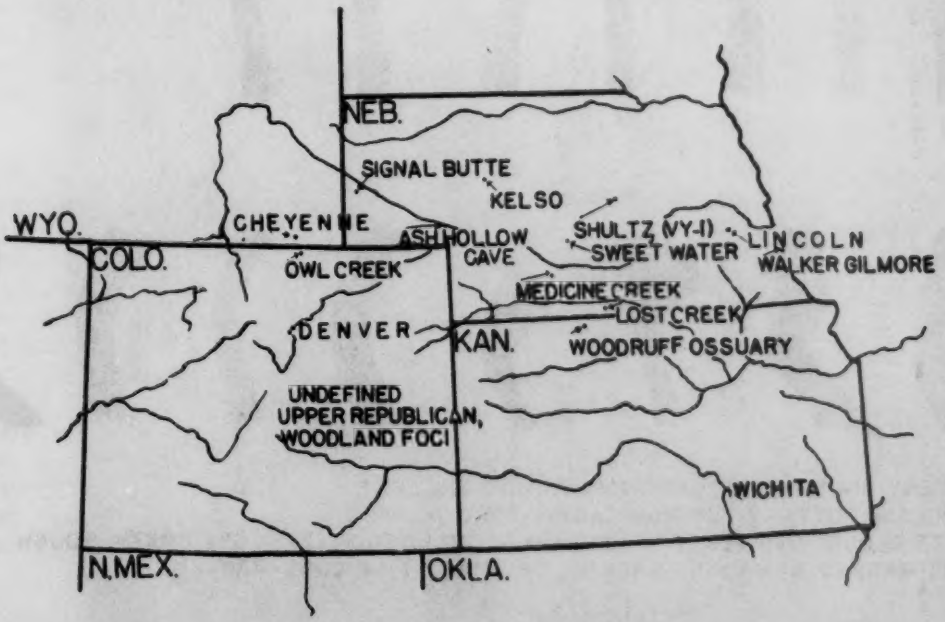
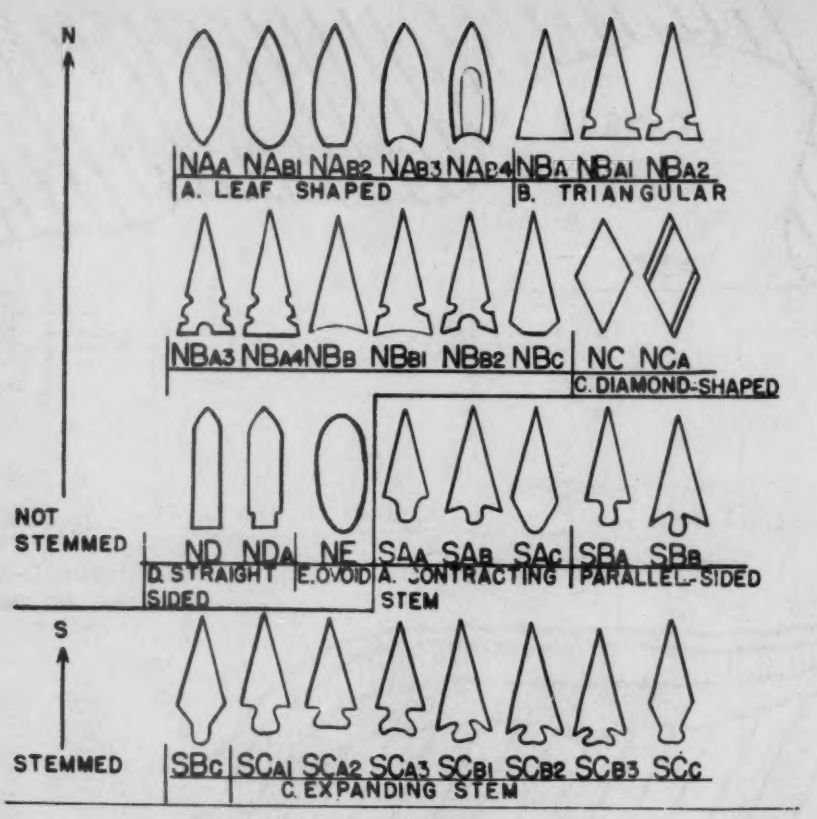
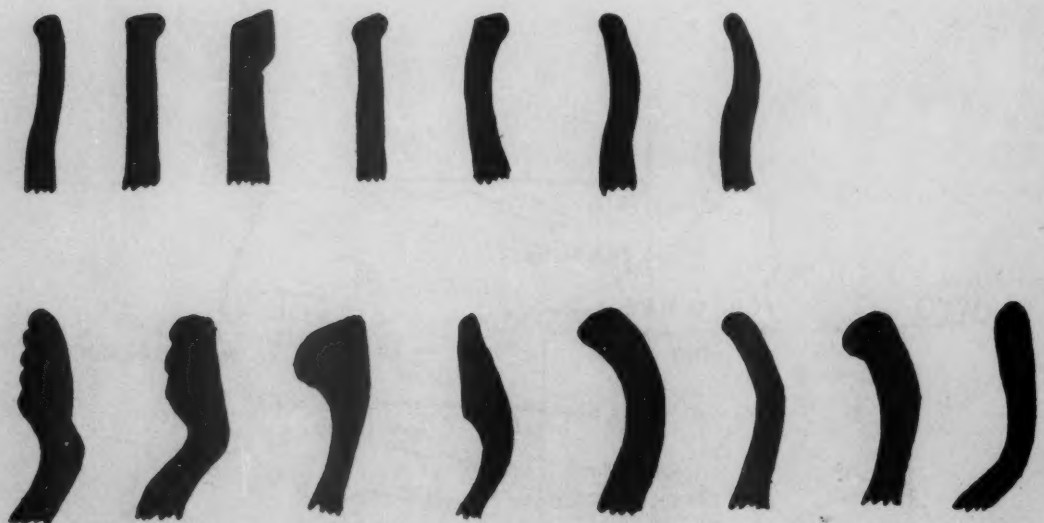

NEB.
SIGNAL BUTTE
KELSO
WYO.
CHEYENNE
ASH HOLLOW CAVE
SHULTZ (VY-I)
SWEET WATER
LINCOLN
WALKER GILMORE
COLO.
OWL CREEK
MEDICINE CREEK
LOST CREEK
DENVER
KAN.
WOODRUFF OSSUARY
UNDEFINED
UPPER REPUBLICAN,
WOODLAND FOCI
WICHITA
N.MEX.
OKLA.

Figure 2

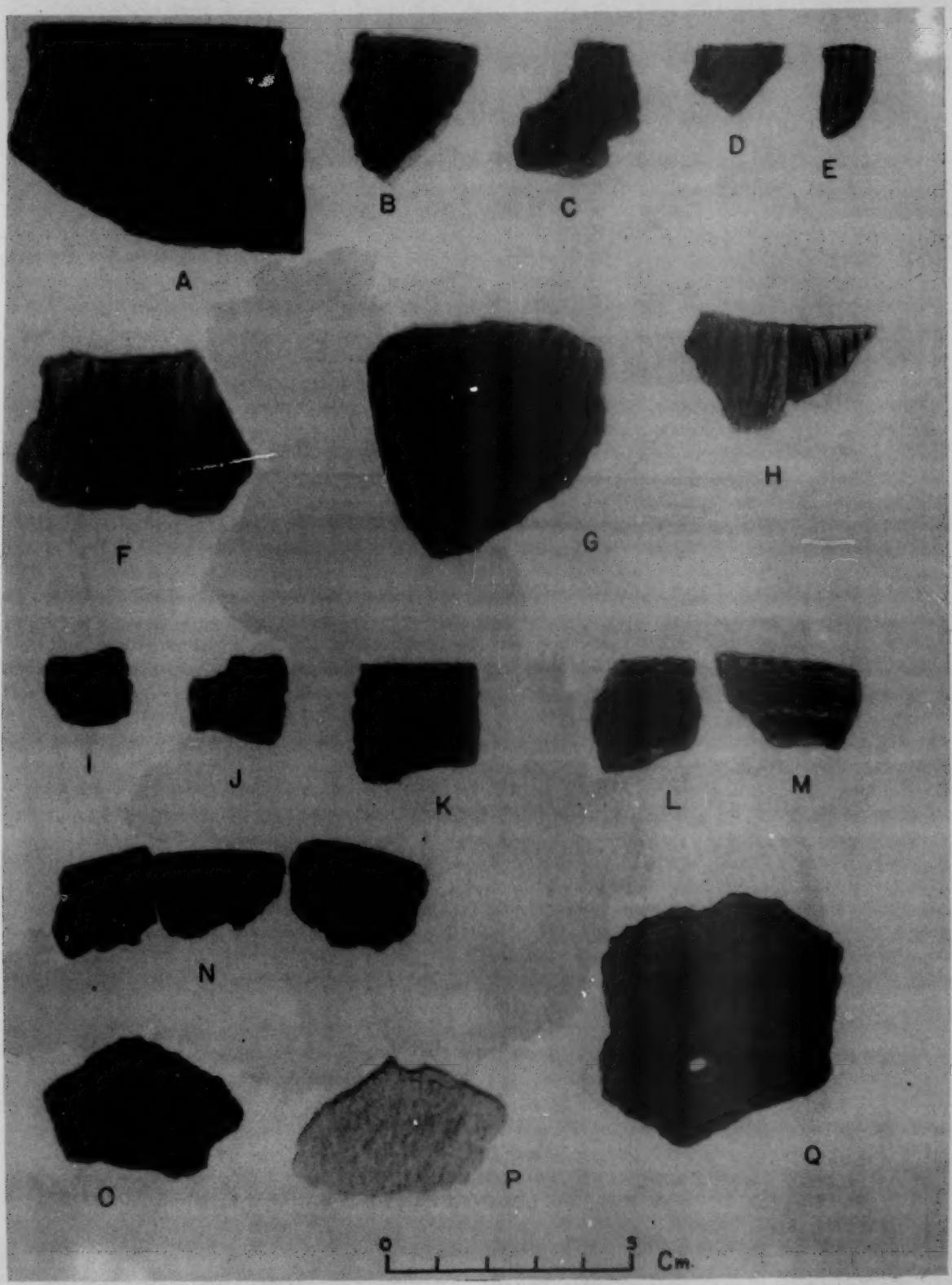


CLASSIFICATION CHART FOR CHIPPED POINTS
(AFTER STRONG)



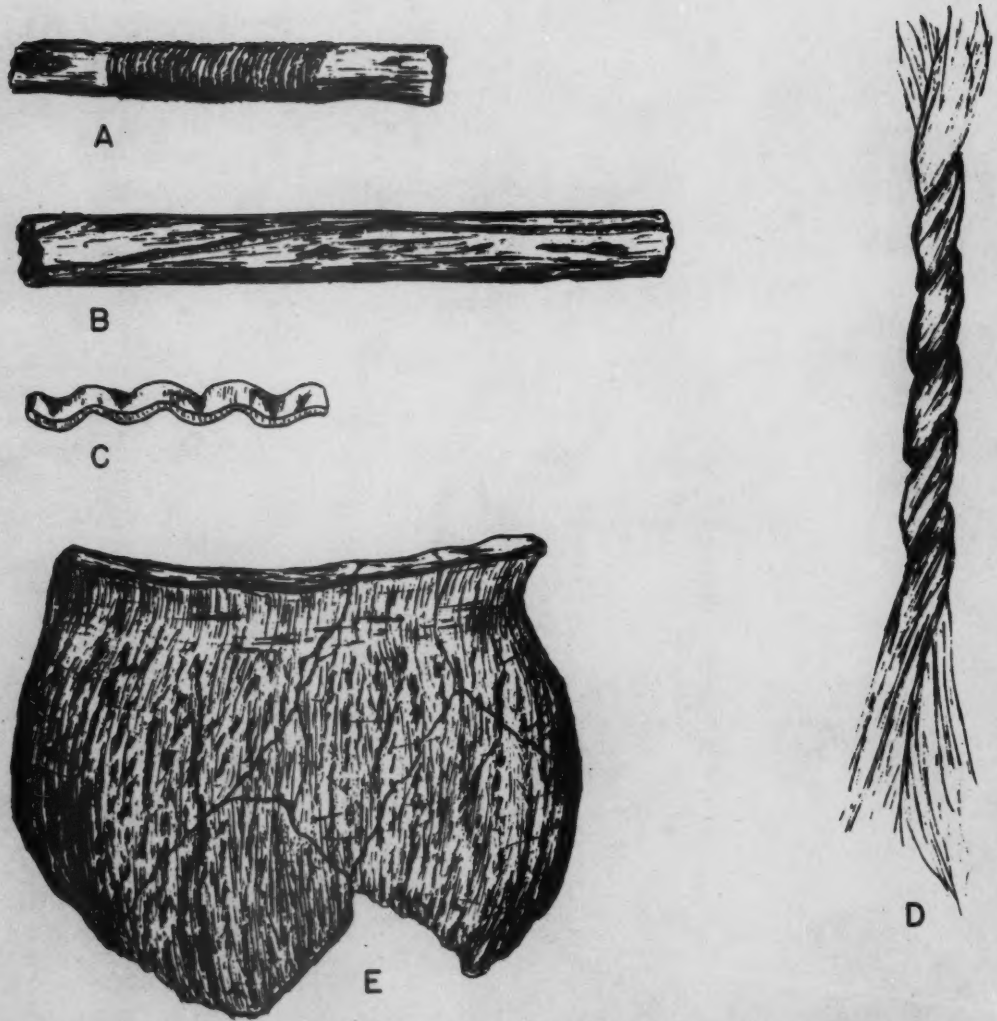
POTTERY RIM PROFILES. EXTERIORS ARE TO THE LEFT.
WOODLAND POTTERY TOP ROW: AGATE CORD-MARKED.
UPPER REPUBLICAN POTTERY BELOW: 5TH SHERD FROM LEFT, OWL CREEK ROUGH CORD-MARKED. REMAINING SHERDS, OWL CREEK FINE CORD-MARKED.

Figure 3



POTTERY, SITES I–IV
A-H, AGATE CORD-MARKED; A-E, H, RIM SHERDS
I-O, Q, OWL CREEK FINE CORD-MARKED. P, OWL CREEK ROUGH CORD-MARKED. I-N RIM SHERDS

Figure 4



A,B, ARROWSHAFT FRAGMENTS. A, TYPE I; B, TYPE II. C, FRAGMENT OF BASKTERY (?)
D, PIECE OF TWINED ROPE. A–D, TWICE NATURAL SIZE
E, PARTIAL POTTERY VESSEL, OWL CREEK ROUGH CORD-MARKED. E, THREE-FOURTHS NATURAL SIZE.

Figure 5

ETHNOHISTORY AND THE PLAINS CONFERENCE

David A. Baerreis

At the 14th Annual Plains Conference for Archeology held at Lincoln, Nebraska, in 1956, the American Indian Ethnohistoric Conference was invited to meet with the Plains Conference in its 15th annual session. It is therefore an opportune time to briefly indicate the nature and history of this relatively new organization, AIEC, and to discuss some of the common interests they share with the Plains archeologists.

AIEC was organized in 1953 under a variant name, the Ohio Valley Historic Indian Conference. This step has been described as ". . . . the fulfillment of a desire long held by historians, ethnologists, archeologists, and linguists to cooperate in the study of the historic Indian, and represents a forward step in the inter-change of information and inter-workings of these various disciplines" (Ethnohistory I (1) : 4). The sharp regional focus implied by this organizational name is derived in large part from the specific research interests of those active in its founding. Despite this the journal of the Conference, Ethnohistory, even in its slim, initial volume published material of broader scope by including some reminiscences of Dr. William S. Webb. The latter were not of his noted archeological work, but rather of his service in Indian Territory in 1903 as secretary to the national attorney of the Seminole Nation.

The second volume (1955) of Ethnohistory saw it launched as a regular professional journal publishing 388 pages devoted to book reviews and articles on American Indians including studies of theoretical and methodological interest. The Conference itself caught up with the scope of the journal it sponsored in its third annual meeting held at Ann Arbor, Michigan, in 1955. At this session its new name, American Indian Ethnohistoric Conference, was adopted as were modifications in the constitution in keeping with its broader interest in the history of the American Indian in general.

Participants in the Conference have occasionally struggled with the term ethnohistory, attempting to plumb its meanings and connotations as an approach. In general, however, this has not been too serious a concern for there is an acceptance of the idea that the history of the American Indian is one which will be resolved only by a cooperative approach through various disciplines. The rich documentary sources available must be studied from the approaches of these varied disciplines as well as by individuals who control the methods and concepts of several areas of study. While it is an obvious fact, it is perhaps frequently overlooked that since the American Indian is essentially a non-literate people, the presence of documentary materials in every instance implies the contact between Indians and western Europeans. Their history during this period, therefore, is a dual one and essentially involves the study of two cultures and the relations between these two cul-

tures. Here certainly we need the aid of specialists in at least these two fields of study.

But I am belaboring the obvious in attempting to expound upon the nature of ethnohistory to the readers of the Plains Anthropologist. The pages of this journal contain frequent articles that are ethnohistorical in character and serve to illustrate the approach. What the AEIC would anticipate in meeting with the Plains Conference is first, bringing to the session a larger number of scholars from other disciplines than normally attend, and secondly profiting from the experience and approach of the many students of the Indian history of the Plains. In attempting to work out a primary theme for a joint session of the two groups, it was suggested that perhaps greater profit would come from a focus of attention upon a single group. The personal bias of the discussants may be reflected in the selection of the Arikara but room for other interests may develop through those concerned with differentiating the Arikara from their neighbors or in determining the relationships between the Arikara and surrounding groups.

The introductory paragraphs sketched the history of the AEIC largely in terms of the development of the journal, Ethnohistory. Subscription to Ethnohistory is only $3.50 or its equivalent in local currency and should be sent to ETHNOHISTORY, Rayl House, Indiana University, Bloomington, Indiana.

Department of Sociology
and Anthropology
University of Wisconsin

NOTES ON A BURNED EARTH LODGE AT THE WARD SITE, NORTH DAKOTA

W. Raymond Wood

In about 1936 the city of Bismarck, North Dakota, erected three full-scale circular earth lodges at the Ward Site. This village (32BL3) is on the east bank of the Missouri River about one mile north of the city of Bismarck. The site is within the bounds of Pioneer Park, and is owned and maintained by the City.

A number of years ago one of the houses burned, and evidence for its former presence is the familiar circular depression surrounded by a low ridge of earth, which is now completely sodded over. Early in June of 1955 a second lodge was consumed by fire, apparently by careless picknickers. The fresh ruins of this full scale earth lodge (Fig. 6) reveal several features of archeological interest.

The illustration clearly shows a large crevice around the circumference of the house which resulted when the roof collapsed. This crevice, which is from one to two feet wide and which averages about two feet in depth, is slowly filling with water-laid deposits derived from the soil of the house ridge. This feature undoubtedly accounts for the strata of water-laid deposits sometimes observed near the walls in excavated earth lodges. The plotting of this feature, when visible, on the map of an excavated house may aid in determining more exactly the diameter of the original structure in sites where the house ridge has been obliterated or where the wall line is obscure. The midline of the crevice occurs just above the base of the leaner posts which rested against the wall posts. Partial filling of the house depression by water-laid deposits is also shown by observations at the Ward Site lodge.

The often-observed phenomenon of a low depression at one side of an earth lodge ruin associated with the entrance is clearly explained by the illustration. Very little earth covered the roof of the entrance, and the collapse of this earth onto the floor of the passage resulted in a distinct break in the continuity of the house ridge. The posts lining the entrance also kept the earth from the house ridge from slumping into the breach. Only a few posts in the entrance survived the fire; all others were wholly consumed. Smoke from the buried and smoldering timbers was visible for about two weeks, despite a light rain that fell nearly continuously for a week after the lodge was fired.

Continuing observation of this house might aid field archeologists in determining more exactly the mechanics of deterioration of earth lodges revealed in excavations, and aid in the interpretation of archeological features.

Department of Sociology and Anthropology
University of Missouri

a. Entrance passage.

b. House ridge and crevice.

Fig. 6. Burned reconstructed lodge at the Ward site, N. D.

THE FOURTEENTH PLAINS CONFERENCE - 1956*

Richard P. Wheeler, Chairman

The Fourteenth Plains Conference was held according to custom on the Thanksgiving weekend, Thursday to Saturday, November 22-24, on the campus of the University of Nebraska in Lincoln. The first half-day was allotted to registering, visiting with colleagues, examining specimens in the Laboratory of Anthropology, and viewing a special photographic exhibit in the adjacent gallery of the School of Journalism. The exhibit included field photographs of recent archeological workings in the Plains and some of the more memorable "digs" in the region from about 1931, when the Conference first started.

The formal meetings opened Thursday afternoon with nine reports of field investigations conducted during the summer of 1956 in Nebraska, Kansas, Missouri, and Illinois. Afterwards there were cocktails and a buffet dinner at the Cornhusker.

Friday morning was given over to eleven more reports of 1956 field researches in Iowa, South Dakota, Nebraska, Oklahoma, and Alberta; in the afternoon six prepared papers were read. Friday evening the Conference membership gathered in the auditorium of the Nebraska State Historical Society Museum for a business meeting and illustrated talks by Robert E. Bell on "Digging in New Zealand," Carlyle S. Smith on "Mulloy and Smith in the South Pacific," and Edward I. Fry on "Fry and Fry on Rarotonga." Thereafter the members repaired to the Museum Staff Room for refreshments graciously provided by the Staff.

In the business session the nominating committee offered the names of Wesley R. Hurt as chairman of the Fifteenth Plains Conference and of Franklin Fenenga as editor of The Plains Anthropologist to succeed himself. Both nominees were unanimously elected. A resolution was made, seconded, and approved without dissent, that the American Indian Ethnohistoric Conference be invited to meet with the Plains Conference at the latter's next sessions. David A. Baerreis, President of the AIEC, accepted the invitation on behalf of his organization.

The last regular session of the Fourteenth Plains Conference, on Saturday morning, was devoted to a symposium on cultural relationships between the Plains and surrounding areas in historic and prehistoric times. The areas dealt with included the Great Basin, the Southwest, Meso-america, and the Caddoan area. Although no astonishing new facts and insights were brought out, the contributions were useful as concise summaries of past findings and current ideas on the various fronts.

*Submitted with the permission of the Secretary of the Smithsonian Institution.

The morning session ended with a reading of the resolutions committee report and a group donation of $37 toward the Earl H. Morris Scholarship Fund for Archaeology at the University of Colorado.

The Conference terminated Saturday afternoon following an open house at the laboratory of the Missouri Basin Project, Smithsonian Institution, in downtown Lincoln.

During the Conference, E. Mott Davis, Reynold J. Ruppe, Jr., Charles H. Lange, and Frank H. H. Roberts, Jr., acted as chairmen of individual sessions. Carlyle S. Smith, E. Mott Davis, and Marvin F. Kivett (Chairman) served on the nominating committee; and Reynold J. Ruppe, Jr., Melvin L. Fowler, and Henry W. Hamilton (chairman) served on the resolutions committee. John L. Champe performed with his usual finesse as local arrangements chairman and was handily assisted in some matters by Franklin Fenenga. The Conference and Conference Chairman are grateful to all of these people for helping to make the 1956 meetings run smoothly and to adhere closely to a rather tough schedule.

Formal Papers Presented at the Fourteenth Plains Conference

Friday, November 23	Charles H. Lange, Chairman
Maxim K. Elias	Known and Unknown about the Ancient Prairie.
Wm. J. Mayer-Oakes	The Plains Archaic Concept (read by E. Mott Davis)
W. Raymond Wood	The Redbird Focus
Frederic Hadleigh-West	The Bayou Manchac Midden: a Physiographic and Archeological Study
Edward I. Fry	Skeletal Remains from the Wallace Mound in Nebraska
Marvin E. Tong, Jr.	Why Dig Up Dead Indians Anyway?
Saturday, November 24	Frank H. H. Roberts, Jr., Chairman
Jesse D. Jennings	Status of Present Thought on the Problem of Plains-Great Basin Relationships.
Donald J. Lehmer	16th Century Pueblo-Plains Relations
Charles H. Lange	Plains-Southwestern Relationships in Historic Times
J. Charles Kelley	Transition and Hiatus: The Plains-Meso-american Periphery.
Robert E. Bell	Plains-Caddoan Relationships.
E. Mott Davis	Paleoclimatological and Typological Queries Concerning Pre-Altithermal Cultural Relations between the Central Plains and Neighboring Areas.

Registrants at the Fourteenth Plains Conference

Adrin B. Anderson	State University of Iowa
David A. Baerreis	University of Wisconsin
Paul L. Beaubien	National Park Service, Omaha
Robert E. Bell	University of Oklahoma
Virginia Bell	Norman, Oklahoma
Charlotte Belske	University of Wisconsin
Robert T. Bray	University of Missouri
Warren W. Caldwell	River Basin Surveys, Lincoln
Flavia W. Champe	Lincoln
John L. Champe	University of Nebraska
John M. Corbett	National Park Service, Washington, D.C.
Donald D. Davis	Glenwood, Iowa
E. Mott Davis	University of Texas
Maxim K. Elias	University of Nebraska
Charles E. Eyman	University of Kansas
Franklin Fenenga	University of Nebraska
Melvin L. Fowler	Illinois State Museum
W. D. Frankforter	Sanford Museum, Cherokee, Iowa
Edward I. Fry	University of Nebraska
H. Raymond Gregg	National Park Service, Omaha
Frederic Hadleigh-West	Louisiana State University
Henry W. Hamilton	Missouri Archaeological Society
Jeanne Hamilton	Missouri Archaeological Society
Herman L. Harpster	River Basin Surveys, Lincoln
Dale R. Henning	State University of Iowa
Fred W. Hilman	Wyoming Archaeological Society
Preston Holder	Washington University, St. Louis
David Horr	University of Kansas
James H. Howard	Kansas City Museum
Harold A. Huscher	River Basin Surveys, Lincoln
Jesse D. Jennings	University of Utah
Alfred Johnson	University of Kansas
Alice B. Kehoe	Museum of the Plains Indian, Browning
Thomas F. Kehoe	Museum of the Plains Indian, Browning
J. Charles Kelley	Southern Illinois University
Marvin F. Kivett	Nebraska State Historical Society
Charles H. Lange	Southern Illinois University
Donald J. Lehmer	University of Omaha
Evelynn Lehmer	Omaha
Lee G. Madison	River Basin Surveys, Lincoln
Richard A. Marshall	University of Missouri
William Mulloy	University of Wyoming
Robert W. Neumann	University of Nebraska
Henry Reider	University of Nebraska State Museum
Frank H. H. Roberts, Jr.	Smithsonian Institution, Washington, D.C.
Paul R. Rowe	Glenwood, Iowa
Reynold J. Ruppe,Jr.	State University of Iowa
James B. Shaeffer	University of Oklahoma
J. M. Shippee	University of Missouri
Carlyle S. Smith	University of Kansas

G. Hubert Smith	River Basin Surveys, Lincoln
Martin Sporer	Murray, Nebraska
Georgie E. Stephenson	Lincoln
Robert L. Stephenson	River Basin Surveys, Lincoln
T. M. Stout	University of Nebraska
Lloyd G. Tanner	University of Nebraska State Museum
Marvin E. Tong, Jr.	Missouri Archaeological Society
J. C. Vinton	Strafford, Missouri
Lucy P. Wheeler	Lincoln
Richard P. Wheeler	River Basin Surveys, Lincoln
Maria E. Wille	University of Kansas
Roscoe Wilmuth	W. H. Over Museum, South Dakota
W. Raymond Wood	State Historical Society of North Dakota
Alan R. Woolworth	State Historical Society of North Dakota
Margarita Worth	Lincoln

River Basin Surveys
Lincoln, Nebraska

INFORMATION FOR CONTRIBUTORS

The Plains Anthropologist publishes articles in anthropology and related fields dealing with the Plains or written by people working in the Plains area. Articles will be accepted on the basis of interest to our readers and will be published in the order in which they are received.

Manuscripts should be typewritten on 8-1/2 x 11 paper, double spaced, and typed on one side of the paper. The copy should be as free of corrections as possible; minor corrections may be made in ink, others by cutting and pasting. Do not make bibliographic citations by footnotes, but include them in the text, thus:

(1) (Wheeler, 1954:8-9, Fig. 2) when author has not been named in text.
(2) (1954:8-9, Fig. 2) when author or reference is named in the text.
(3) (1954) when author has been named and no page reference is needed.
(4) (pp. 8-9) when there is frequent reference to the single work of an author which has already been cited.

Terminal citation of sources should be arranged alphabetically by author. Names of journals and institutions should be given in full. Name of the published as well as place of publication should be noted in the case of commercially published works:

Lehmer, Donald J.

1954 The Sedentary Horizon of the Northern Plains. Southwestern Journal of Anthropology, Vol. 10, No. 2, pp. 139-159.

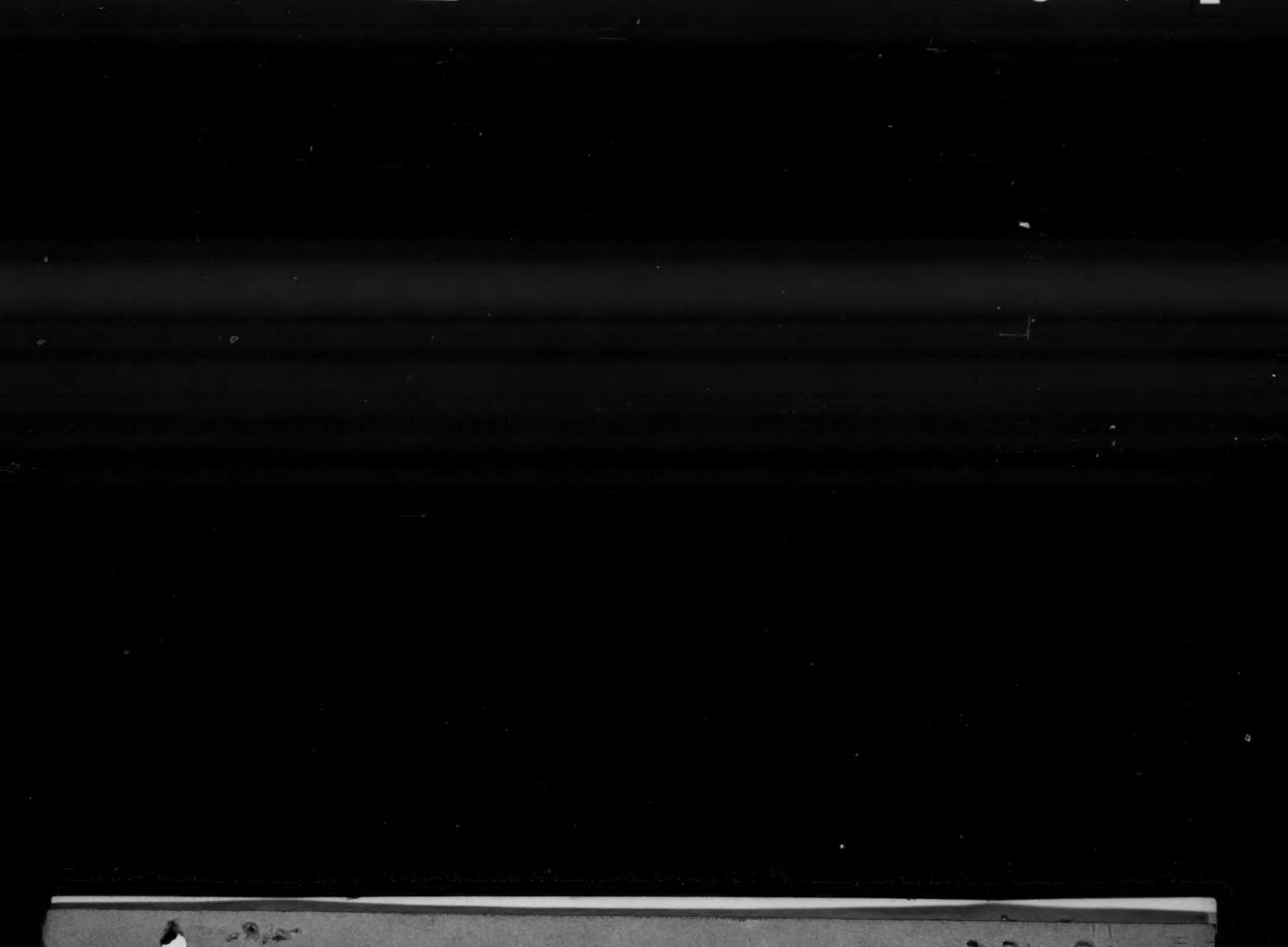
Ewers, John C.

1939 Plains Indian Painting. Stanford University Press, Palo Alto.

Footnotes should not be used unless essential material cannot be incorporated in the text.

Illustrations should be of the size at which they are to be printed. Line drawings in black ink reproduce more clearly than photographs. Allow space for figure number and title. Authors may be asked to share extra costs arising from numerous or extraordinary illustrative materials.

We cannot supply proof but care will be exercised in following copy accurately.

Twenty reprints are supplied free to the author. Larger numbers will be supplied at cost when they are ordered prior to time of going to press.

Refer to back issues of the Plains Anthropologist for answers to further questions regarding style and format.